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# EXAMINING AN ASYNCHRONOUS GROUP DISCUSSION BOARD ADAPTATION OF A PARENT-MEDIATED BEHAVIOR INTERVENTION FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS

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EXAMINING AN ASYNCHRONOUS GROUP DISCUSSION BOARD  
ADAPTATION OF A PARENT-MEDIATED BEHAVIOR INTERVENTION FOR  
CHILDREN WITH AUTISM SPECTRUM DISORDERS

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DISSERTATION

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A dissertation submitted in partial fulfillment of the  
requirements for the degree of Doctor of Philosophy in the  
College of Education  
at the University of Kentucky

By

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## ABSTRACT OF DISSERTATION

### EXAMINING AN ASYNCHRONOUS GROUP DISCUSSION BOARD ADAPTATION OF A PARENT-MEDIATED BEHAVIOR INTERVENTION FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by social and communication deficits, as well as restricted, repetitive, and stereotyped behaviors, interests, and activities (American Psychiatric Association, 2013). Although important relationships have been shown and described among the issues of challenging behavior, parent stress, and parenting sense of competence for families of children with ASD, there is a shortage of intervention programs appropriately suited for families which target these issues. Some programs have been developed and tested, but none is directly applicable for the target population. This is notable because of the connections drawn in the literature between families of children with ASD and the issues of challenging child behavior, parent stress, and parent sense of competence. Additionally, access to ASD-trained clinicians and research supported delivery options for families in rural areas is severely limited.

COMPASS for Hope (C-HOPE) is an 8-week parent intervention program that was developed with the option of telehealth or face-to-face delivery. This study examined an asynchronous group discussion board adaptation of C-HOPE, which was developed to further support underserved families. Three main hypotheses were made: (1) Parents will report less challenging child behaviors post-intervention; (2) Parents will report lower levels of stress post-intervention; and (3) Parents will report higher sense of competency post-intervention. With a small sample size of 10, paired-samples t-tests were conducted and effect sizes were calculated to compare the pre- and post-intervention scores for challenging child behavior, parent stress, and parenting sense of competence.

There was a statistically significant difference in the scores for challenging child behavior pre-intervention ( $M = 146.40$ ,  $SD = 35.36$ ) and post-intervention ( $M = 123.10$ ,  $SD = 28.35$ );  $t(9) = 3.05$ ,  $p = 0.01$ . The effect size for this analysis ( $d = 0.73$ ) was found to fall between Cohen's (1988) convention for a medium ( $d = 0.50$ ) to large ( $d = 0.80$ ) effect. There was also a statistically significant difference in the scores for parent stress pre-intervention ( $M = 122.60$ ,  $SD = 25.73$ ) and post-intervention ( $M = 109.50$ ,  $SD = 26.47$ );  $t(9) = 2.51$ ,  $p = 0.03$ . There was a medium effect size for this analysis ( $d = 0.50$ ).

There was not a significant difference in the scores for parenting sense of competence pre-intervention ( $M = 55.20$ ,  $SD = 17.59$ ) and post-intervention ( $M = 50.50$ ,  $SD = 17.51$ );  $t(9) = 1.11$ ,  $p = 0.30$ . Additionally, treatment adherence and social validity for the intervention were acceptable. The implications of these findings are discussed.

**KEYWORDS:** Autism, behavior, telehealth, parent-mediated intervention, asynchronous intervention, parent stress, parenting sense of competency

Alexis D. Rodgers

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09/05/2018

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# **CHAPTER 1**

## **INTRODUCTION**

Parenting skills, parenting stress, and challenging child behavior are salient issues for all families, but especially so for families of children with autism spectrum disorder (ASD). Each issue is unique in the way it affects parents and children with ASD. Foremost, the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) defines ASD as a neurodevelopmental disorder characterized by social and communication deficits, as well as restricted, repetitive, and stereotyped behaviors, interests, and activities. Although challenging behavior is not included in the diagnostic criteria outlined in the DSM-5, researchers have consistently reported higher levels of challenging behaviors in individuals with ASD (Matson & Nebel-Schwalm, 2007; Matson, Wilkins, & Macken, 2008). Therefore, it is crucial to understand challenging behaviors in ASD and to offer support to families of children with ASD and challenging behaviors.

Next, all parents experience varying levels of stress (Craig et al., 2016). However, parents of children with ASD consistently report experiencing higher levels of stress than do parents of typically-developing children and parents of children with other developmental disabilities (Baker-Ericzén, Brookman-Frazee, & Stahmer, 2005; Hayes & Watson, 2013; Paynter, Riley, Beamish, Davies, & Milford, 2013). Although stress is not unique to parents of children with ASD, the levels of stress experienced by this group are uncharacteristically high. Notably higher stress levels suggest that a clinical focus on stress in this population is critical to improved child and parent outcomes because of the

impact of stress on family life (Krakovich, McGrew, Yu, & Ruble, 2016) and the relation of stress to other child and family factors, which will be discussed later in this chapter.

Third, throughout the past three decades, numerous researchers have described the power of parent training in decreasing challenging behaviors of typically-developing children (Barkley, 1997; Kazdin, 2005; Lundahl, Nimer, & Parsons, 2006; Reyno & McGrath, 2006; Webster-Stratton & Reid, 2010). Additionally, training parents of children with ASD to act as co-therapists can improve outcomes with regard to challenging child behaviors, as compared to providing clinical services to the children alone (Lovaas, Koegel, Simmons, & Long, 1973; Zisser & Eyberg, 2010). With the knowledge that parent training can be a powerful instrument of change in the area of challenging child behavior, one can see the importance of a focus in research and clinical practice on parenting skills and parental self-efficacy (i.e., the beliefs parents hold about their own skills with regard to coping with the challenges of raising their children; this will be discussed in further detail later in this paper).

### **Importance of COMPASS for Hope**

There has been extensive research conducted in the areas of parenting skills, parent stress, and challenging child behavior, and one purpose of this literature review is to critically analyze those domains of research. As will be discussed in a later section of this introduction, many researchers (e.g., Baker-Ericzén et al., 2005; Goble, Ruble, & McGrew, 2013; Jones & Prinz, 2005) have focused on the importance of the relationships among parenting skills, parent stress, and challenging child behavior. However, although the disparities in these areas for families of children with ASD are apparent in the current

body of literature, there are few intervention options available to clinicians who seek to improve parent and child outcomes.

A second purpose of this literature review is to identify the gaps in the literature that offer an underlying rationale for the current study. One idea that clearly arises is the need for families to have appropriate supports in place to facilitate positive outcomes in the areas of parenting skills, parenting stress, and challenging child behavior. A training and support program for parents of children with ASD and challenging behaviors, COMPASS for Hope (C-HOPE), has been developed with the intention of improving outcomes in three major areas: (a) decreasing challenging child behavior; (b) decreasing parenting stress; and (c) increasing parenting sense of competency. C-HOPE is a proposed approach to address the limitations identified by the current literature, which will be discussed later along with specifics of the program itself and the current study.

Ultimately, a comprehensive review of the existing literature revealed that parenting stress, challenging child behavior, and a lack of parenting self-efficacy may form a cyclical pattern in such a way that prevents children from learning appropriate behaviors and prevents parents from managing challenging behaviors and dealing with stressors to the best of their abilities (e.g., Feng, Shaw, Skuban, & Lane, 2007; Hastings, 2002; Worcester, Nesman, Mendez, & Keller, 2008). Therefore, it is sensible that an intervention program offered to families of children with ASD should target all three of these areas.

### **Challenging Child Behavior**

**Impact on the child.** Challenging behavior demonstrated by children with ASD has an impact on not only the individual child, but also on the family unit and on others

involved in provision of care for the child. With a focus first on the child independently, children with ASD who display challenging behaviors have been reported to experience less positive interactions with their peers, fewer outings in their communities, less typical home environments, and decreased access to necessary intervention and education services (Anderson, Laken, Bradley, & Chen, 1992; Matson & Wilkins, 2007). Literature in the area of foster care suggests that children with challenging behaviors in general experience greater instability than do other children, are more frequently removed from their parents' homes, are placed in a higher number of settings (including institutions), and are less likely to return to their biological families after initial removal from the home (Rosenberg & Robinson, 2004; Ziviani, Feeney, Cuskelly, Meredith, & Hunt, 2012).

In addition to these outcomes, children with ASD who display challenging behaviors also frequently have difficulty regulating emotions (Feng et al., 2007). Emotional dysregulation can be problematic for children with both internalizing and externalizing behavior concerns, although the dysregulation may manifest differently based on which type of behaviors with which the child has greater struggles. Further, Feng et al. revealed that although children and parents reciprocally communicate, parents typically hold control over the majority of the interaction patterns with their children. Mothers with depression and a concurrent lack of positive emotion and responsiveness, then, are more likely to have children who demonstrate negative emotions and challenging behaviors. This finding may point to a cycle of negative emotions and affect being exchanged between parents and children with challenging behaviors, and it also



highlights the importance of the impact on the family when a child exhibits such behaviors.

**Impact on the parents and family.** As mentioned, parents also experience significant impact when their children display challenging behaviors. For example, from a developmental perspective with regard to understanding their family issues, one study revealed that parents often have difficulty obtaining information that is useful and accurate regarding their children's behaviors, as well as obtaining services and supports that are suitable for learning appropriate behavior management (Worcester et al., 2008). Worcester et al. also reported that raising a child with challenging behaviors can be financially stressful, in one or both of two ways: directly purchasing medications, health insurance, special foods, etc., related to the child's specific needs; and meeting barriers with regard to professional advancement in one's own career field when raising a child with challenging behaviors.

Not only does the child experience isolation from community outings, as mentioned above, but the parents also often feel isolated (Worcester et al., 2008). Community isolation can result from intensity of time and resources used to care for the child, stigma attached to challenging behaviors, parental fear that the child will be in danger in the community, and reactions from other members of the community when the child displays challenging behaviors in public. Oftentimes, families are forced to change their daily routines in order to avoid or reduce the child's time spent in the community due to challenging behaviors. Additionally, parents may feel a sense of guilt associated with spending time away from their child for personal and/or professional reasons.

Although providing parents with behavior supports has been recognized as the most effective intervention for the child (Ruble & McGrew, 2007), many families do not have access to behavior support services from qualified clinicians (Brookman-Frazee, Baker-Ericzén, Stadnick, & Taylor, 2012; Hodgetts, Zwaigenbaum, & Nicholas, 2015). According to Brookman-Frazee et al., parents reported a sense of frustration with attempting to navigate service systems, as well as a lack of support in understanding which services are most appropriate for their families given their concerns about their children and their developmental levels.

Additionally, many parents in one qualitative study reported feeling displeased with the progress their children were making in their current services, which typically only involved outpatient therapy sessions and medication management (Brookman-Frazee et al., 2012). However, even if behavior support services or other appropriate services were available in reasonable proximity to the families, these services were not recommended by service providers at their local community mental health centers and/or the providers of the behavior support services were insufficiently trained in understanding and working with families of children with ASD. As a result of parents' inability to obtain appropriate services, they tend to report a sense of frustration and stress associated with their children's diagnoses in general and challenging behaviors in particular.

Participant race and socioeconomic status are reported in less than 50% of studies conducted examining interventions for challenging behavior and ASD (Robertson, Sobeck, Wynkoop, & Schwartz, 2017), so it is difficult to glean whether rates of challenging behavior differ across race or other diversity factors. However, one study in

adults with intellectual disability (ID) found that, although there was no significant main effect of race, there was a significant interaction between ASD diagnosis and race (Horovitz, Matson, Hattier, Tureck, & Bamburg, 2013). Specifically, for those adults with comorbid ID and ASD, White participants displayed more challenging behaviors than did Black participants. In contrast, educational research consistently suggests that teachers and other adult service providers often attribute behaviors to Black children as being “challenging” or “externalizing,” and they are less likely to identify such behaviors in White children (Nunley, 2013; Spaulding et al., 2010). This disparity is problematic and suggests a need for the focus on differences, or lack thereof, in challenging behavior across race and other diversity factors in the ASD population.

### **Parenting Stress**

High levels of parental stress have been associated with both severity of ASD symptoms and challenging behaviors (Harper, Dyches, Harper, Roper, & South, 2013; Krakovich et al., 2016). In a study by Goble et al. (2013), challenging child behavior was a predictor of parental stress and accounted for the highest amount of variance as compared to other factors, including child intelligence quotient, severity of ASD symptoms, and level of adaptive skills. Moreover, Worcester et al. (2008) reported that challenging behaviors are associated with stress for not only parents, but for siblings and extended family members, as well. Challenging behaviors are connected to strain both within immediate families and cross-generationally (Worcester et al.). When parents and other family members experience high levels of stress and low levels of external support, it can be more difficult for them to effectively manage challenging child behavior.

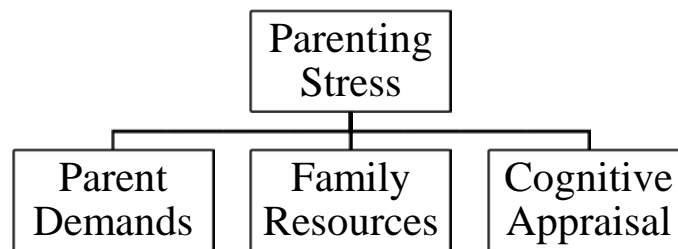
Overall, parents of children with ASD report higher stress levels than both parents of typically-developing children and parents of children with other developmental disabilities (Baker-Ericzén et al., 2005; Hayes & Watson, 2013; Paynter et al., 2013). Research has also revealed differences in levels of parent stress based on race and other diversity factors. For example, parents who live in higher socioeconomic areas may have lower stress levels than parents who live in rural or urban areas where support services are not readily available (Bromley, Hare, Davison, & Emerson, 2004). Additionally, parents whose race is not White have reported receiving less family-centered care, which impacts the quality of services provided (Montes & Halterman, 2011). One study reported that Black and Hispanic parents of children with special healthcare needs in general (i.e., chronic physical, developmental, behavioral, or emotional conditions) reported higher levels of dissatisfaction with care, as well as difficulty securing appropriate services, than their White counterparts (Ngui & Flores, 2007). In addition to the differences in stress based on parent and family diversity factors, parent stress in general has been reported to influence the effectiveness of interventions (Baker-Ericzén et al., 2005). Therefore, it is vital to offer support and training to parents of all backgrounds which address stress in order to deal with the challenges of raising a child with ASD.

### **Models of Parent Stress**

There are a number of factors that play a role in stress for parents, particularly for parents of children with ASD and other developmental disabilities. Several researchers have theorized potential models of parent stress given the complexity of the issue. These models incorporate some consistent themes, and many build on the findings and theories

of other researchers. Three main models of parenting stress which are relevant to parenting skills and challenging child behavior are reviewed below.

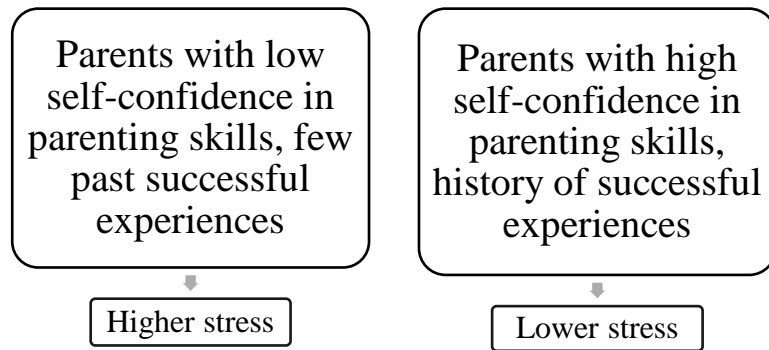
**Double ABC-X model.** McCubbin and Patterson (1983) offered the Double ABC-X model, which focuses on relationships between three main categories for explaining parent stress and coping. According to McCubbin and Patterson, all of the factors that impact parent stress fall broadly into one of the three categories: parent demands (such as the specific stressors or events experienced), resources available to the family (including social supports), and parental cognitive appraisal, or the parents' perceptions of the stressful event (Figure 1.1). The Double ABC-X model views heightened parent stress as relative to at least one of these three main categories, but it is also common that stress is related in some way to each of the categories.



*Figure 1.1.* Parent stress categories, according to the Double ABC-X Model.

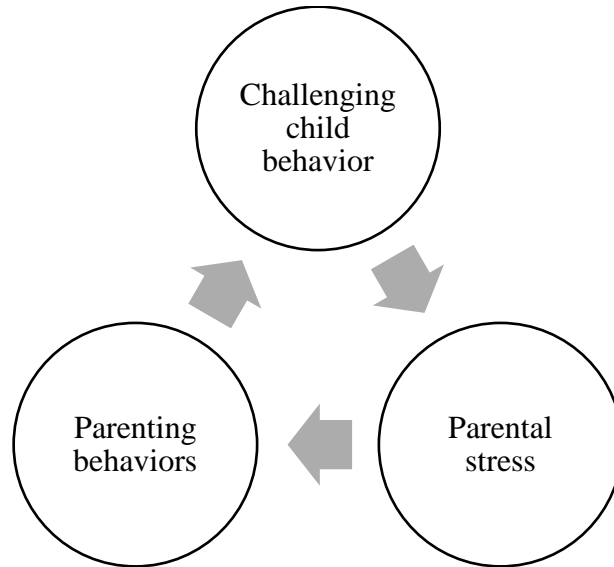
**Lazarus's transactional model.** Lazarus and Folkman (1984) proposed a model which expands upon the Double ABC-X model with regard to cognitive appraisal. Lazarus's transactional model considers in detail the attributions parents make to the stressful events they experience. According to Lazarus and Folkman, parents who lack confidence in their ability to manage challenging child behaviors or cope with stressors may be more prone to experiencing stress. However, parents who have had prior success with managing challenging behavior and coping with stressors, and therefore feel more

confident in their ability, may be less prone to feeling stressed (Figure 1.2). Lazarus's transactional model suggests correlations among parenting self-efficacy, ability to cope, and behavior management strategies.



*Figure 1.2.* Lazarus's explanation of cognitive appraisal in parent stress.

**Hastings's model.** Hastings (2002) incorporated aspects of both McCubbin and Patterson's (1983) and Lazarus and Folkman's (1984) models when espousing a new theory. Hastings's model purports that parents and children are in a constant relationship of jointly impacting one another. Specifically, challenging behavior from the child often leads to increased stress for the parent; likewise, a parent who is experiencing a significant amount of stress is likely to implement specific parenting behaviors that are more likely to reinforce challenging behaviors in the child (Figure 1.3).



*Figure 1.3.* Parent stress relationships, according to Hastings's model.

All three models indicate relationships between the parents' stress and other family factors in some way. Lazarus's transactional model provides a robust explanation about how challenging child behavior may factor in to stress experienced by the parent. However, Hastings's model of parent stress accounts for not only the child's behavior, but also the parents' behavior and strategies/skills. Despite the inherent struggles in social communication of children with ASD, parent-child attachment research has indicated that not only do parents and children with ASD attach at similar levels of security as parents and typically-developing children (Rutgers, Bakermans-Kranenburg, Van IJzendoorn, & Van Berckelaer-Onnes, 2004), but also that children with ASD who have a secure attachment with their parents are "better able to initiate and respond in two-way pre-symbolic gestural communication; organize two-way social problem-solving communication; and engage in imaginative thinking, symbolic play, and verbal communication" (Seskin et al., 2010, p. 949). Therefore, attachment does not seem to be

a necessary element in parent stress models. Rather, one element that may be missing is the idea of hope, or parents' sense of optimism for the future. This feature is briefly captured in the Double ABC-X model, but cognitive appraisal does not fully capture parents' sense of hope for the future.

### **Parenting Skills**

**Parenting self-efficacy.** Parenting skills are also closely tied with both the challenging behaviors children display and their parents' stress levels. One way to conceptualize parenting skills is by examining the beliefs parents hold about their ability to cope with challenges (i.e., self-efficacy). Bandura (1977) described self-efficacy as being entwined in social learning theory and involving attainment of performance, observation of others' experiences, affirmation from others of one's abilities, and physiological states that can be used to judge abilities. Self-efficacy extends to parents and their beliefs and perceptions about their own abilities to carry out the responsibilities and expectations of parenting. It can be notably more difficult for parents of children with ASD to experience self-efficacy than for parents of typically-developing children (Kuhn & Carter, 2006). Jones and Prinz (2005) reported correlations among parenting self-efficacy, parenting stress, challenging child behaviors, and parent depression. Research has not yet explored differences in parenting self-efficacy based on race, but it is well-known in the literature that Black individuals report experiencing lower levels of perceived personal control (Bruce & Thornton, 2004; Shaw & Krause, 2001). However, regarding factors such as self-esteem, Black participants frequently report higher levels than their White counterparts (Hoelter, 1982). Therefore, a focus on self-efficacy appears potentially important to decreasing stress and mental health issues in parents and



challenging behavior in children, and this focus should be culturally sensitive to the individual needs of parents and families.

**Parent training.** One way to increase both parental self-efficacy and parenting skills is through parent training. As mentioned earlier, parent training can be an effective vehicle of change regarding challenging child behavior and, thereby, a reduction in parent stress (e.g., Barkley, 1997; Lovaas et al., 1973; Zisser & Eyberg, 2010). For parents of children with ASD in particular, parent training has historically been used in treatment plans, with regard to teaching parents and caregivers how to deliver interventions in the areas of social behavior, language acquisition and development, and management of challenging behaviors (Koegal, Schreibman, Britten, Burke, & O'Neill, 1982). Although most parent training programs have been tested primarily with White, middle-class families (Coard, Wallace, Stevenson, & Brotman, 2004; Dyches, Wilder, Sudweeks, Obiakor, & Algozzine, 2004; Horovitz, Matson, Rieske, Kozlowski, & Sipes, 2011), one meta-analysis of parent training interventions for parents of children with behavior problems revealed that these interventions were least effective for families who were economically disadvantaged (Lundahl, Risser, & Lovejoy, 2006). Therefore, researchers developing and testing parent training programs should take familial diversity factors into account. A review of the currently available relevant parent training programs follows.

**SSTP.** Several researchers have demonstrated the influence of parent training through testing specific programs designed to teach parents necessary skills in their children's treatment. One such program which is well-known is Stepping Stones Triple P – Positive Parenting Program (SSTP; Sanders, Mazzucchelli, & Studman, 2003), which was developed specifically to train parents of children with developmental disabilities in

behavior management techniques and other related parenting skills. Tellegen and Sanders (2013) conducted a meta-analysis on SSTP with 12 evaluation studies and found moderate effect sizes for decreased child problems. Effect sizes were also significant with regard to parenting styles (i.e., authoritative, authoritarian, indulgent/permissive), parenting satisfaction and efficacy, parental adjustment, parental relationship, and observed child behaviors.

Although the effect sizes suggest positive results with use of SSTP, it is not without disadvantages. Hodgetts, Savage, and McConnell (2013) used a multiple case-study design to investigate how SSTP works for families of children with ASD in particular, and the researchers reported that SSTP requires “stability in family well-being and adequate time” (p. 2582). In other words, the program may not be appropriate for families lacking in basic parenting skills or struggling to manage multiple responsibilities, which can be stressful for parents in and of itself. Further, Hodgetts et al. stated that practitioners are required to be certified in Triple P to administer SSTP, but there is no regulation of practitioner training or background. Practitioners must obtain certification in the program to deliver it, but they do not necessarily have robust knowledge of counseling/behavior management in general or ASD in particular.

***HOT DOCS.*** Another program, Helping Our Toddlers, Developing Our Children’s Skills (HOT DOCS; Armstrong, Lilly, & Curtiss, 2006), was developed for parents of young children with developmental delays and challenging behaviors. Childres, Shaffer-Hudkins, and Armstrong (2012) examined the outcomes of HOT DOCS for caregivers of children with ASD using a pre-post design and found that parents reported increased knowledge and decreased challenging child behaviors after

completion of the program. However, Childres et al. also reported that HOT DOCS does not include any assessment of gains in strengths and functional skills, which is crucial for children with ASD.

*ASCEND*. One program which has been developed specifically for parents of children with ASD is Autism Spectrum Conditions – Enhancing Nurture and Development (ASCEND; Pillay, Alderson-Day, Wright, Williams, & Urwin, 2011). Pillay et al. (2011) found that completion of ASCEND resulted in an increase in parent knowledge and confidence and a decrease in challenging child behavior. This study did not involve a randomized controlled trial including a control group, so it is unknown whether positive results were due to participation in ASCEND. Additionally, ASCEND did not address parent stress as an outcome of participation in the program.

Ultimately, researchers have shown that participation in parent training can be beneficial for all parents, and emerging evidence suggests that it can be helpful to parents of children with ASD. Based on this evidence and other research previously discussed, including lower parent self-efficacy in caregivers of children with ASD, a focus on the fusion of parent training with increased parent self-efficacy may be helpful for increasing parenting skills. As the literature has demonstrated, when parents' skills and self-efficacy are increased, they are more prepared to manage challenging child behavior and the stress that accompanies parenthood.

### **Parent-Mediated Interventions in ASD**

In addition to parent training, evidence supporting parent-mediated interventions has been increasing in the current body of literature, although results have been mixed with improvements most often noted in the areas of social communication and symptom

severity, whereas support is currently emerging in the areas of feeding, play, independence, and behavior (Dammann, Althoff, Hope, & Ausderau, 2017). In particular, one randomized comparative efficacy study found that hands-on parent training in a developmental behavioral intervention targeting joint attention, symbolic play, engagement, and regulation resulted in large treatment effects on joint attention and small to medium effects on play diversity, highest play level achieved, and generalization to the child's classroom for child-initiated joint engagement (Kasari, Gulsrud, Paparella, Hellemann, & Berry, 2015). The other intervention examined in the study by Kasari and colleagues, a parent-only psychoeducational intervention, resulted in reduced parenting stress associated with child characteristics.

Another study by Watson and others (2017), which examined effects of an intervention for one-year-olds identified as being at-risk for ASD, revealed minimal evidence for the main effects of the intervention on child outcomes (targeting pivotal behaviors, including intentional communication, joint engagement, self-regulation, exploration). However, parents who participated in the intervention showed increases in responsiveness to their children than control group parents. A multiple baseline design study reported gains in verbal communication and decreased ASD symptoms following parent participation in a Pivotal Response Treatment program for young toddlers aged 15 to 21 months (Bradshaw, Koegel, & Koegel, 2017). A study examining a community-based parent-mediated intervention targeting social communication skills in older children, up to age eight, revealed significant improvement in child communication skills and a strong trend for parent intervention adherence for the intervention group from baseline to 12 weeks (Stadnick, Stahmer, & Brookman-Frazee, 2015).

Overall, studies examining parent-mediated interventions for children with or suspected of having ASD have been shown in some studies with differing types of designs (including RCTs) and with varying ages (from young toddlers to school-aged children) to have positive effects, particularly in the area of social communication (Bradshaw et al., 2017; Kasari et al., 2015). However, evidence is still emerging with regard to the efficacy of parent-mediated behavioral interventions for ASD (Dammann et al., 2017). In addition to the diversity in study design and child age across current literature supporting the use of parent-mediated interventions, the existing studies were conducted across rural, urban, and suburban populations (Dammann et al., 2017). This study aims, in part, to add to the current body of literature regarding parent-mediated behavior interventions for families in need of access to services across geographic location.

### **Limitations of the Current Literature**

The existing literature clearly shows that children with ASD display more challenging behaviors than many other children (e.g., Matson & Nebel-Schwalm, 2007; Matson et al., 2009), as well as that challenging behaviors can be problematic for both the child and the family (e.g., Anderson et al., 1992; Brookman-Frazee et al., 2012). Additionally, parents of children with ASD experience increased stress when compared to parents of typically developing children and children with other developmental disabilities (e.g., Baker-Ericzén et al., 2005; Hayes & Watson, 2013). The current literature also suggests that parents of children with ASD are not as likely as other parents to experience high levels of parenting self-efficacy (Kuhn & Carter, 2006), but

they benefit from parent training programs aimed at improving their parenting skills (e.g., Lovaas et al., 1973; Zisser & Eyberg, 2010).

Further, the current literature is beginning to point to important relationships among the three issues of challenging child behavior, parenting stress, and parenting skills (e.g., Hastings, 2002; Worcester et al., 2008). However, the existing body of research is not without limitations. Specifically, researchers have only recently begun connecting the three central issues. More research examining the relationships among the three and how they may impact each other is needed to better understand which issue(s) in the cycle to target first and how to approach provision of services for these families.

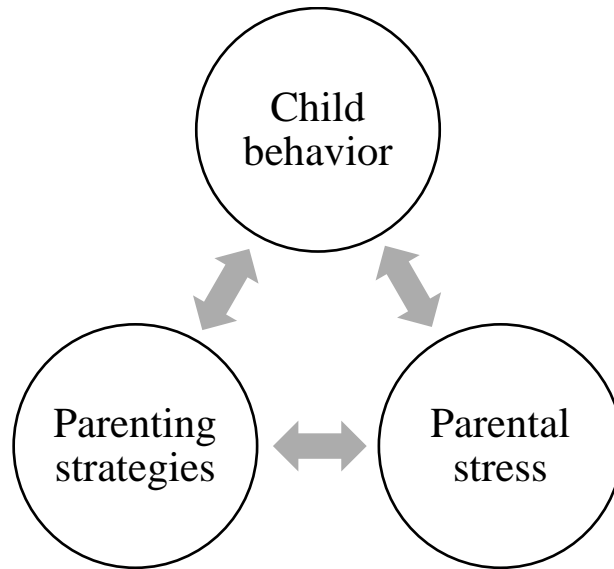
Moreover, although important relationships have been shown and described among the issues, there are not many intervention programs specifically designed for families of children with ASD which target the central problems of challenging child behavior, parenting stress, and parenting skills. As mentioned, some programs have been developed and tested (e.g., SSTP, HOT DOCS, and ASCEND); however, none is directly applicable or appropriate for the target population, including families from underserved areas. This is notable because of the connections drawn in the literature between families of children with ASD and the three central issues. As described by the American Psychological Association (2013), children with ASD have unique needs centering on social and communication issues, and it is imperative that intervention programs address these needs.

### **A Need for Intervention for Parents of Children with ASD**

C-HOPE is an adaptation of the Collaborative Model for Promoting Competence and Success (COMPASS; Ruble, Dalrymple, & McGrew, 2012). COMPASS is a

parent/teacher consultation intervention developed specifically for ASD, and it has been tested and verified for young children in two randomized controlled trials (Ruble, Dalrymple, & McGrew, 2010; Ruble, McGrew, Toland, Dalrymple, & Jung, 2013), as well as for transition-aged youth in one randomized controlled trial (Ruble, McGrew, Toland, Dalrymple, Adams, & Snell-Rood, 2018). C-HOPE uses the COMPASS framework to identify and address each individual child's profile of personal and environmental supports (protective factors) and personal and environmental challenges (risk factors), as well as to balance the supports and the challenges in order to improve outcomes.

With further investigation, C-HOPE may help to fill the gaps in the literature which remain regarding the cycle of low parenting skills, high parenting stress, and high challenging child behavior. C-HOPE takes into account the models and theories of others (e.g., Harper et al., 2013; Hastings, 2002; Lovaas et al., 1973), but it also adds to the previously-established literature by considering the three main outcomes along with the specific needs of families and children with ASD. Similar to Hastings's model, but unique in one particular way, C-HOPE asserts that not only does child behavior, parenting stress, and parenting skill contribute to one another, but they may also impact each other in a reciprocal pattern (Figure 1.4). This is important because previous intervention programs have not relied on these three outcomes so heavily. Additionally, C-HOPE adds in the element of optimism for the future that was not addressed by previous models of parent stress, parent competence, and child behavior. C-HOPE may be a necessary contribution to the literature which considers the importance of the entire family unit, as well as the specific needs of children with ASD.



*Figure 1.4.* C-HOPE’s model of child behavior, parent stress, parenting strategies.

### **Rural Healthcare Services**

Many parents of children with ASD report having a difficult time accessing services that are high quality, but those living in rural areas report the greatest challenges (Chen, Liu, Su, Huang, & Lin, 2007; Mandell, Novak, & Zubritsky, 2005). Appalachia is one region of the United States which is considered rural and underserved, and much of the eastern part of Kentucky (the state in which this research took place) lies in Appalachia. One particular service that families in rural areas, and Appalachia in particular, report as being an unmet need is behavior management (Murphy & Ruble, 2012). Further impacting this issue, although many clinicians recommend behavioral supports provided to children and families in their home settings, most families in rural areas report that such supports are not available locally (Mello, Goldman, Urbano, & Hodapp, 2016), and thus they are not able to follow through with clinical recommendations. However, in addition to families living in rural areas, Thomas, Ellis,



McLaurin, Daniels, and Morrissey (2007) reported that service provision is limited and difficult to access for families from racial and ethnic minority backgrounds, with low parental education, and not following a major treatment approach (e.g. TEACCH: Marcus, Garfinkle, & Wolery, 2001; Lovaas: McEachin, Smith, & Lovaas, 1993; Floortime: Wieder & Greenspan, 2003). Therefore, it is important to consider a number of familial factors when considering lack of access to or usage of services for ASD.

**Telehealth interventions.** The researchers who developed C-HOPE saw telehealth technology as a potential solution to the difficulties rural families experience in accessing behavioral healthcare services. Telehealth involves providing healthcare services, including psychological services, through the use of technology, although the definition of telehealth interventions spans broadly (Sood et al., 2007). Previous research has indicated that services provided through telehealth technology produce similar outcomes to those provided via face-to-face modalities, and can often be less costly than services delivered in-person (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Lindgren et al., 2016; Myers, Valentine, & Melzer, 2007; Slone, Reese, McClellan, & Deleon, 2012). Although Sood and colleagues explained that defining telehealth can be complex, the modalities typically recognized when researchers and practitioners discuss telehealth interventions include the following: (1) live video or synchronous services, when a provider and client/patient interact in real time using audiovisual telecommunications technology; (2) store-and-forward or asynchronous services, when a practitioner uses secure electronic communications system to render services to a client/patient that are not in real time; (3) remote patient monitoring, when a provider collects personal data from a client/patient via electronic communication technologies for the purpose of care and

support across geographic locations; and (4) mobile health, when a client/patient uses a mobile communication device for health education and support.

Asynchronous telehealth interventions are gaining popularity and are beginning to be more researched, including in the fields of nursing (Spadaro & Hunker, 2016), education (Allaire, 2015), and mental health (Myers & Roth, 2016). However, currently no literature exists which supports the use of asynchronous parent-mediated behavioral interventions for ASD, or the use of asynchronous telehealth interventions for ASD at all. In addition to telehealth, however, there are other service modalities that have been researched within the ASD population, including distance education (Wainer & Ingersoll, 2013), self-guided Internet interventions (Backman et al., 2018), and online professional development for service providers of children with ASD (Lessard, Murphy, Bolick, & Ecker, 2016). These modalities have been found to be effective in delivering services to families that need them, but more research is needed with regard to the use of asynchronous telehealth services in particular. C-HOPE was developed with the intent to be modified for delivery across a range of modalities, in order to be accessible to families regardless of geographical location or financial resources, while maintaining fidelity of intervention implementation and individuality of service delivery. This study aims, in part, to contribute to the existing literature regarding different modalities of service delivery for ASD interventions.

### **Summary of Background Information**

With the use of a collaborative research grant funded by the University of Kentucky and the University of Louisville, the researchers utilized an iterative approach to design and test C-HOPE, which had previously been implemented with 33 families of

children between the ages of 3 and 12 with ASD in Kentucky (Kuravackel, Ruble, Reese, Ables, Rodgers, & Toland, 2017). The participating families resided in the metropolitan areas of Louisville and Lexington, as well as the rural Appalachian areas of Morehead and Hazard. In a subsample of families ( $N = 14$ ), the researchers made modifications to C-HOPE and tested it using telehealth technology. Specifically, the researchers conducted individual sessions with families via telephone, and group sessions took place with families meeting in a central location and using videoconferencing technology to connect with the researchers.

Using a pre-post, quasi-experimental waitlist control design in a small sample ( $N = 24$ ) of parents of children with ASD ( $M_{\text{age}} = 8.12$  years;  $SD_{\text{age}} = 2.57$ ), analysis of covariance (ANCOVA) revealed significant pre-post changes in the three main outcome areas of child behavior, parenting stress, and parenting sense of competency, with effect sizes ranging from 0.54 to 0.71. Further, analyses revealed no significant differences based on modality of delivery (face-to-face or traditional telehealth formats) for child behavior and parent stress, although a small effect was observed for the outcome of parenting sense of competency. Specifically, the face-to-face condition carried higher mean scores. Interpretation of effect sizes suggests a medium effect size for all three main outcomes (Cohen, 1988). There were no significant changes during the waitlist control period for any of the three outcomes. Additionally, parent satisfaction was high and therapist fidelity was at least 80% for both the face-to-face and telehealth treatment conditions.

The purpose of the current study was to evaluate the efficacy of a web-based version of C-HOPE that could result in improved, clinically-significant parent and child

outcomes commensurate with outcomes of preliminary findings by the researchers who developed C-HOPE. The purpose of adapting the intervention into a web-based version was twofold. First, the researchers wanted to expand upon the current literature indicating similar treatment outcomes provided through telehealth technology and face-to-face modalities (Barak et al., 2008). Second, scheduling for previous iterations of C-HOPE proved to be difficult for many families, and these parents and caregivers, as well as others residing in rural and underserved areas, shared throughout the research and during ASD family summits attended by the researchers, that having access to an intervention that was more accommodating of their schedules, needs for services, and geographical locations would be beneficial. Therefore, the web-based adaptation of C-HOPE was developed to meet the expressed needs of families and remain current with evidence in the area of telehealth interventions.

An additional purpose of the study is to help address the need for parent support for families who do not have ready access to services, such as families from racial and ethnic minority backgrounds, with low parental education, living in nonmetropolitan areas, and not following a major treatment approach (Thomas et al., 2007). The concluding product is a tested manual that can be delivered by clinicians in varying communities to support parents of children with ASD and challenging behaviors. C-HOPE uses the COMPASS framework to assess personal and environmental supports and challenges, and then to generate individualized goals and objectives for each child in the program. C-HOPE is an 8-week program and consists of four, 2-hour group sessions which address common issues and concerns specific to ASD, as well as four, 1-hour individual sessions which address the individualized behavior goals developed using the

COMPASS profile of supports and challenges, as well as the stress prevention and wellness plans parents were encouraged to develop using skills learned throughout group sessions.

### **Research Aims and Hypotheses**

The first major aim of this study was to compare pre- and post-outcomes of C-HOPE being delivered as a fully web-based intervention. Researchers also obtained parent input on therapist fidelity of treatment implementation, as well as parent satisfaction with each session and with the program as a whole, with the goal of making comparisons and adjustments to the program based on parent feedback. The main hypotheses were that parents/caregivers who participated in the asynchronous group discussion board format of C-HOPE would experience: (1) greater parent competency, (2) decreased child problem behavior, and (3) decreased parent stress, after their completion of the program.

A secondary aim of this study was to compare the asynchronous group discussion board intervention format of C-HOPE to previous findings when delivered in both face-to-face and traditional telehealth formats. The hypothesis tied to this aim was that minimal to no differences based on delivery approach (asynchronous group discussion board, face-to-face, or traditional telehealth) would be observed. The hope with this aim was that C-HOPE could be more widely disseminated across varying communities in urban, metropolitan, and rural areas, and that it would be accessible to parents with schedules which do not permit them to commit to meeting at specific times each week and/or parents who do not have transportation to and from a clinic or another site to receive therapeutic services.

## **CHAPTER 2**

### **METHODS**

#### **Participants**

Fifteen participants from across the states of Virginia, Ohio, and Kentucky were recruited for the study. Participants were the parent and/or primary caregiver for a child (1) with ASD; (2) with challenging behaviors, excluding extreme physical aggression and self-harm; and (3) between the ages of 3-12. Participants were recruited through organizations supporting individuals with ASD and their families (e.g., local Autism Society of America chapters, other support groups, listservs, and Facebook groups), as well as university/hospital clinics serving individuals with ASD and their families (e.g., University of Louisville, Cincinnati Children's Hospital Medical Center, and Virginia Tech). Participants were required to have access to a telephone and Internet connection with either a computer, tablet, or smartphone, and training for using the online platform (i.e., Canvas) was provided for all participants prior to beginning treatment. Families were also ineligible if they: (1) had another child already in the study or (2) were not comfortable with the assessments or intervention conducted in English. Families who were deemed ineligible to participate were referred to ASD resources and/or services in their local communities.

Although 15 parent participants were initially recruited for the study, 4 of these participants (26.7%) dropped out after enrollment. Previous studies similar to the current study cited a wide range of dropout rates, from 9.1% (Whittingham, Sofronoff, Sheffield, & Sanders, 2009) to 48.5% (Pillay et al., 2011). Although the pilot study for C-HOPE reflected a dropout rate of 12.1% (Kuravackel et al., 2017), this rate was explained

mostly by the telehealth groups that were primarily provided to rural families. The reasons for attrition cited in the study conducted by Kuravackel et al. included “lack of child care services while the parent or caregiver attended the training session, distance to travel to the TH site, and preference for child focused therapies over a parent-delivered intervention” (p. 413). The current study addressed these issues by using a web-based platform to deliver the content and an asynchronous group discussion board to offer support. The reasons provided by parents in the current study for being unable to follow through with all sessions, however, included only issues with regard to time commitment and preference for child-focused therapies. Although eleven participants completed the intervention (i.e., participated in each of the eight sessions), only ten completed the final evaluation measures, and attempts to contact the participant who did not complete the evaluation were not successful. Therefore, the final sample of the study was ten, although demographic information includes all 15 of the recruited participants. Refer to Figure 2.1 for a consort flow diagram representing study enrollment and retention.

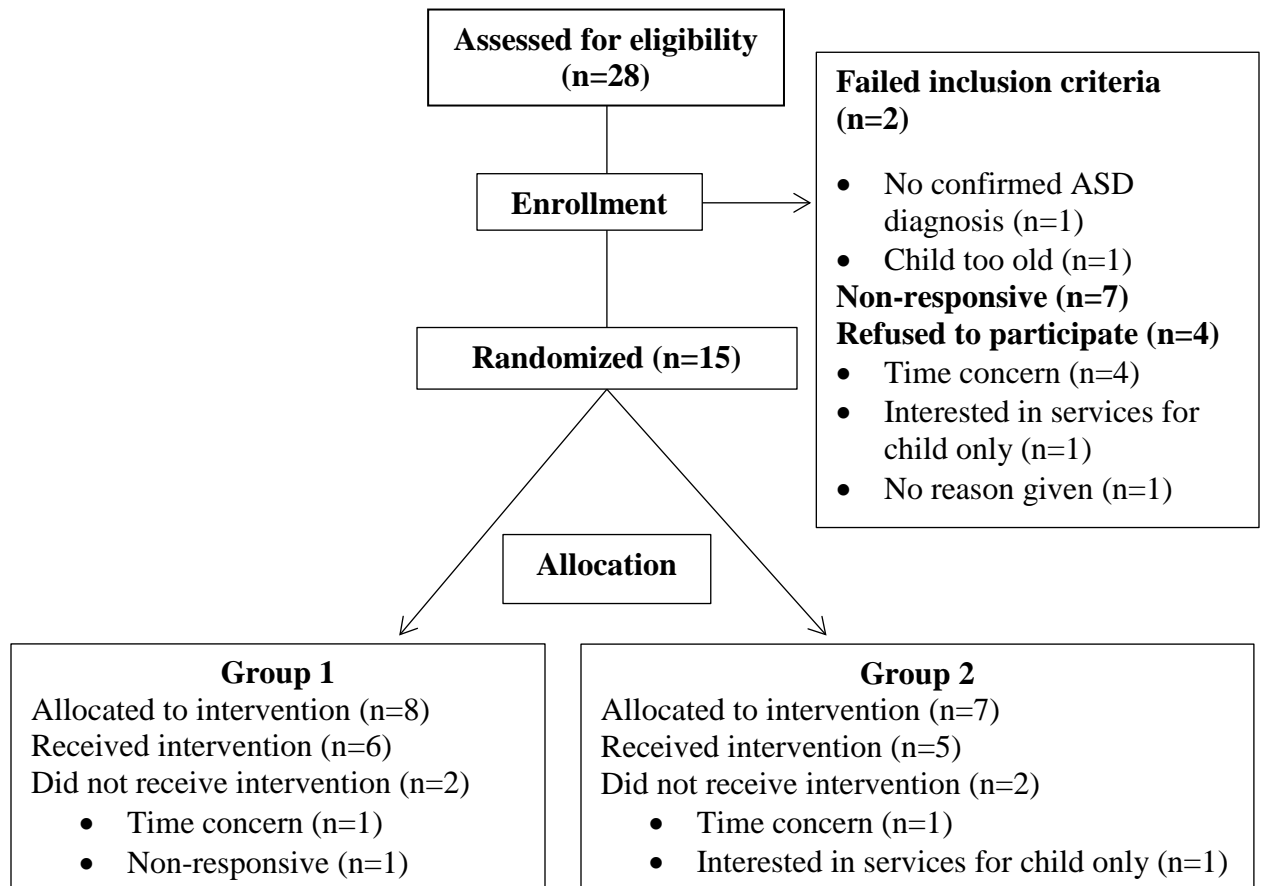


Figure 2.1. Consort flow diagram.

Demographically, child ages ranged from 4 years, 7 months to 12 years, 2 months. Children were approximately 73% male and 27% female, whereas parent participants were 100% female. Child racial demographics included approximately 73% White participants and 27% Black participants. With regard to household income, approximately 7% earned less than \$10,000, approximately 7% earned \$25,000-49,999, approximately 47% earned \$50,000-99,999, and 40% earned \$100,000 or more. Although the researchers aim for C-HOPE to be accessible to all families who have difficulty accessing services, including those in rural areas, recruitment in these areas proved to be difficult. Approximately 26% of participants who enrolled in the study lived in rural counties as defined by the U.S. Census Bureau, and approximately 74% lived in nonrural



counties (U.S. counties with less than 50% of the population living in rural areas; Ratcliffe, Burd, Holder, & Fields, 2016). Finally, approximately 53% of participants' children were receiving some other kind of behavioral or mental healthcare services, such as applied behavior analysis or individual therapy, whereas approximately 47% of participants' children were not receiving such services. Detailed participant demographic information is presented in Table 2.1 below.

Table 2.1  
*Participant demographic information*  
 Child variables

	<i>M (SD)</i>	Range
Age in months	94.80 (26.98)	55-146
SCQ Total Score	26.67 (5.96)	14-35
	<i>N</i>	%
Race (Black)	4	26.67%
Race (White)	11	73.33%
Gender (Female)	4	26.67%
Gender (Male)	11	73.33%
Lives with mother only	3	20.00%
Lives with both mother and father	11	73.33%
Lives with other caregiver	1	6.67%
Receiving other behavioral or mental healthcare service	8	53.33%
Family variables		
	<i>M (SD)</i>	Range
Mother years of education	15.80 (2.83)	12-21
Father years of education	14.15 (2.51)	12-18
Number of child's siblings	1.47 (1.30)	0-4
	<i>N</i>	%
Parent participant gender (Female)	15	100.00%
Residents of rural counties	4	26.67%
Annual household income (<\$100,000 annual income)	9	60.00%

Participant screening was conducted over the telephone during the recruitment process and prior to assigning participants to groups, whereas baseline evaluations were completed after group assignment had occurred in order to ensure that baseline data were

recent and accurate. Baseline evaluation procedures are detailed below. Participants were randomized into either the first treatment group or the second treatment group, which started two weeks after the beginning of the first group. Participants were informed of group assignment one week before the first group was asked to complete baseline evaluations, and the first author did an additional “check-in” with participants assigned to the second group one week before they were asked to complete baseline evaluations.

## **Measures**

A review and explanation of all measures used in the study follows. Additionally, internal consistency (Cronbach, 1951) for each of the measures, calculated using the current data set at baseline, are reported throughout this section.

**Autism screeners.** Two screeners were used during the recruitment process: the Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT-R/F; Robins, Fein, & Barton, 2009) and the Social Communication Questionnaire (SCQ; Rutter, Bailey, Berument, Lord, & Pickles, 2001). If the child had a chronological age of less than four years, the M-CHAT-R/F was used, whereas the SCQ was used for all children aged four and older. The sensitivity and specificity of the SCQ have proven to be satisfactory in school-aged children and adolescents at high risk of ASD, and is strongly correlated with the Autism Diagnostic Interview, Revised (ADI-R; Chandler et al., 2007; Corsello, Hus, Pickles, Risi, Cook, Leventhal, & Lord, 2007; Bölte, Holtmann, & Poustka, 2008). Specifically, Corsello and colleagues used receiver operating curves (ROC) to examine the area under the curve (AUC) and found that the SCQ was better able to differentiate between ASD and disorders other than ASD in older children (ages 8 and above) than in younger children (ages 7 and below), but that lowering the cutoff

score to 15 improved sensitivity (0.89). Internal consistency for the SCQ was excellent ( $\alpha = 0.95$ ).

The M-CHAT-R/F has demonstrated ability to detect ASD in toddlers (Robins, Casagrande, Barton, Chen, Dumont-Mathieu, & Fein, 2014). Specifically, children with an initial total score greater than or equal to three and a follow-up score greater than or equal to two had an almost 50% risk of being diagnosed with ASD and an almost 95% risk of being diagnosed with any type of developmental delay or concern. Using the total score for identification was found to be more effective than alternative scoring methods. Robins and colleagues recommended using an algorithm based on three risk levels in order to optimize clinical utility and reduce age of diagnosis and therefore allow the child to participate in early intervention services. Additionally, Robins and colleagues found that the M-CHAT-R identified ASD at a higher rate than the original M-CHAT. Internal consistency for the M-CHAT-R/F was not calculated with the current sample due to all participants being above the cutoff age.

**Challenging behavior.** Challenging child behavior was measured using the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999), which is a 36-item parent-report measure of conduct-problem behavior in children between the ages of 2 and 16 years. The 36 items are rated on two scales: (a) The Intensity Scale asks for a frequency of occurrence rating for each behavior item and (b) The Problem Scale asks the parent to identify the problem behaviors (yes/no responses), with the sum of “yes” responses yielding the problem score. Only the total score, or Problem Scale score, was used in data analysis for the current study. Evidence of reliability and construct validity

has been found with a variety of samples (Abrahamse et al., 2015; Gross et al., 2007; Rhee & Rhee, 2015). Internal consistency for the ECBI was good ( $\alpha = 0.89$ ).

**Parent stress.** Parenting stress was measured using the Parental Stress Index – Fourth Edition (PSI-4; Abidin, 2012), which is a standardized parent-report questionnaire designed for parents of children ranging in age from 1 month to 12 years. According to Abidin, reliability coefficients ( $\alpha$ ) for the Total Stress scale were equal to or greater than 0.96, which indicates that this measure has high internal consistency. Additionally, test-retest reliability coefficients ranged 0.65 to 0.96 for the Total Stress score (Abidin). Use of the PSI has been validated with a number of different samples, including a variety of ASD parent samples (Lee, Gopalan, & Harrington, 2016; Silva & Schalock, 2012; Touch  que, Etienne, Stassart, & Catale, 2016). Internal consistency for the PSI-4-SF was excellent ( $\alpha = 0.90$ ).

**Parenting sense of competence.** Parenting sense of competence was measured using the Being a Parent Scale (BPS; Johnston & Mash, 1989), which is a 16-item questionnaire measuring parents' views of their competence as parents on dimensions of their satisfaction with their parenting role (reflecting the extent of frustration, anxiety, and motivation) and feelings of their efficacy as a parent (reflecting competence, problem solving ability, and capability in parenting role). Items are scored on a six-point Likert scale (Strongly agree to Strongly disagree), with higher total scores on the BPS indicating high parenting sense of competence. According to Johnston and Mash, these factors have produced scores with high levels of internal consistency for the Total Score ( $\alpha = 0.79$ ), Satisfaction factor ( $\alpha = 0.75$ ), and the Efficacy factor ( $\alpha = 0.76$ ). Internal consistency for the BPS with the current sample was good ( $\alpha = 0.82$ ).

**Therapist, client, and relationship variables.** The researchers also measured therapist fidelity and parent satisfaction using scales developed specifically for C-HOPE. Fidelity was measured as a percentage of whether the therapist carried out critical elements of each session, according to parent report. For example, parents responded “yes” or “no” regarding whether the therapist discussed particular topics, whether the session incorporated appropriate materials and ideas, etc. Internal consistency for the fidelity checklists was good ( $\alpha = 0.88$ ) as calculated at final evaluation. See Appendix A for a sample group session fidelity checklist. Satisfaction was measured based on parent perceptions of particular features of each session, according to a Likert scale of one to four, with one being Extremely Dissatisfied and four being Extremely Satisfied. For example, the satisfaction questions involved asking the parent to what extent she/he felt involved in the session, felt that the therapist listened to what she/he had to say, etc. Internal consistency for the satisfaction questionnaires was good ( $\alpha = 0.81$ ) as calculated at final evaluation. The satisfaction questionnaires also included space to provide qualitative input for recommendations, supports parents might need for implementing ideas shared, etc. See Appendix B for a sample individual session satisfaction questionnaire.

To measure parent well-being from session to session, the Outcome Rating Scale (ORS; Miller & Duncan, 2000) was used. The ORS is a short measure of client well-being intended for progress monitoring. The ORS is comprised of four subscales, which are each rated by the client using a 10-cm line visual analog scale. Clients are instructed to place a mark on each line, with low estimates toward the right of the line and high estimates toward the left. The ORS has a maximum score of 40, with scores 25 and lower

indicating need for a helping relationship. Internal consistency for the ORS was excellent ( $\alpha = .92$ ), as calculated at final evaluation. As measures of therapeutic alliance, the Session Rating Scale Version 3 (SRS; Johnson, Miller, & Duncan, 2000) and Group Session Rating Scale (GSRS; Duncan & Miller, 2007) were used. The SRS was administered at the conclusion of each individual session, whereas the GSRS was administered at the conclusion of each group session. The SRS and GSRS are short measures of alliance which encourage regular engagement between therapist and client regarding their relationship. Similar to the ORS, the SRS and GSRS are each comprised of four subscales, rated using the same visual analog scale and scoring system. Scores from 0–34 indicate poor alliance, 35–38 indicate fair alliance, and 39–40 indicate good alliance. Internal consistency for both the SRS ( $\alpha = 0.94$ ) the GSRS ( $\alpha = 0.92$ ) was excellent, as calculated at final evaluation.

## **Procedures**

The aim of this study was to test the efficacy of C-HOPE using a fully web-based adaptation. The first author adapted the program so that individual sessions were conducted via telephone just as in the pilot study (Kuravackel et al., 2017). Group sessions were pre-recorded using a tripod-mounted iPad in a room with a television monitor showing the PowerPoint presentations mounted behind the first author. The first author presented the group material just as it had been presented in previous waves of C-HOPE and prompted the participants to post in an online discussion board each time a discussion topic arose. See Figure 2.2 for a screen-captured example of one of the group session videos. The group session videos were edited to add visual prompts reminding participants to complete forms and participate in discussion board topics, and the videos

were linked via Vimeo to Canvas, a learning management system incorporating cloud-native software, often utilized for online classes in public and higher education.

Discussion boards were also built on Canvas, and all handouts were housed on the learning management system cloud, as well.



*Figure 2.2.* Screen capture of Group Session 2 video

Participants were instructed on how to create a free Canvas account and navigate its interface in order to access the course page and use the materials, and they were able to play the videos and participate in the discussion board at a time and location convenient to them. Participants were able to virtually discuss material via the Canvas discussion board and interact with each other asynchronously. Specific prompts and questions related to session information, and consistent with the prompts and questions posed during the pilot C-HOPE study, were posed for each group session to begin



participants in discussion, and ongoing discussion was encouraged to continue throughout the week of each group session. The discussion board was monitored by the first author in order to answer questions and ensure that participants understood the discussion prompts and engaged appropriately.

Ample literature documents the impact of common factors on treatment outcomes, such as the therapist, the client, and the relationship (McGrew, Ruble, & Smith, 2016). The researchers also collected information on the fidelity of implementation, parent satisfaction regarding the intervention sessions, parent well-being, and therapeutic alliance. This information was critical to collect due to the importance highlighted in empirical literature regarding fidelity of implementation (O'Donnell, 2008; Swanson, Wanzek, Haring, Ciullo, & McCulley, 2011), patient satisfaction (Al-Abri & Al-Balushi, 2014), and client well-being and the therapeutic relationship (McGrew et al., 2016) as contributors to intervention effects. In addition to helping the researchers understand these contributors in relation to the asynchronous group discussion board adaptation of C-HOPE, a future goal of this program of research is to test the intervention on a wider scale and examine its dissemination to rural communities with the use of telehealth technology. Therefore, a focus on how to disseminate the intervention most widely is necessary.

The University of Kentucky Office of Research Integrity reviewed and provided approval for this study and its materials and procedures. All baseline evaluation, final evaluation, and individual and group session data were collected using Qualtrics. Screening was completed during the recruitment process to ensure participants met inclusion criteria; screening consisted of completing a brief screening measure (either the

M-CHAT-R/F or the SCQ), collecting IEPs and/or psychological reports as a secondary confirmation of ASD diagnosis, and ensuring parents were interested in participating to address challenging behaviors that did not include extreme physical aggression or self-harm. During the recruitment stage, participants were provided via email a copy of the IRB-approved informed consent form informing participants of the study's purpose, rights as research participants, and any risks and/or benefits associated with the study. Participants were not required to physically sign and email a copy of the informed consent form; rather, the first page of the baseline evaluation survey contained the same form, and participants acknowledged their understanding of the information provided and agreed to participate in the research study by clicking "yes" on the form. The order of all measures was the same for all participants, and each participant was emailed a link to the Qualtrics measures prior to each session. Rather than providing their names or any other identifying information, participants were asked to provide their unique participant identification number on each Qualtrics form they completed.

## **Design**

The study was a 10-week long, pre-post design conducted out of the University of Kentucky using telehealth technology. As mentioned, recorded group session videos were uploaded onto Canvas, which is a secure platform, and to which only parent participants had access. The Canvas course page included a group discussion board, where parents interacted with each other asynchronously. Although participants were encouraged to watch the group session at a time and location convenient to them during the assigned "group session weeks," there was a suggested deadline for each session (i.e., by Thursday evening of a group session week) so that all parents had the opportunity to interact with

each other via the online discussion board regarding the topics discussed in the group session before the week ended.

The two groups of participants were all recruited from October 2017 through January 2018. Both groups participated in C-HOPE, and all outcome measures were collected immediately before and immediately following participation in the intervention, regardless of group assignment. Participants were randomized into either the first group, which consisted of eight parents/caregivers who participated in C-HOPE from mid-January through early March, or the second group, which consisted of seven parents/caregivers who participated in C-HOPE from the end of January through the end of March. Although randomization is typically not utilized in pre-post designs, it was used in this study because the design was changed after proposal of the study. Both groups participated in the intervention, but because they began participation at different times, the researchers wanted to ensure that there were no patterns between the assignment of participants into the group that began treatment first versus the group that began treatment second. A detailed outline describing all study sessions is provided in Table 2.2 below.

Table 2.2  
*C-HOPE study sessions and topics discussed*

Session	Duration	Delivery Format	Goals
Baseline Session	2 hours	Online – Qualtrics	Assess all participants in the areas of child behavior, parenting stress, and parenting sense of competence
Individual Session 1	1 hour	Telephone	Review COMPASS profile, identify a problem behavior to address; review C-HOPE philosophy, how to use data collection forms
Group Session 1	2 hours	Online – Canvas	Overview of the program, ASD, resources, and child behavior
Group Session 2	2 hours	Online – Canvas	Discuss child behavior, behavior management techniques
Individual Session 3	1 hour	Telephone	Develop personalized behavior plan (see Appendix C for example of a behavior plan), including goals and objectives, using COMPASS framework
Group Session 3	2 hours	Online – Canvas	Discuss parenting strategies, positive behavior management approaches
Group Session 4	2 hours	Online – Canvas	Discuss the emotions and stress associated with parenting a child with ASD
Individual Session 3	1 hour	Telephone	Evaluate and modify behavior plan; review personal implementation of parenting strategies
Individual Session 4	1 hour	Telephone	Review of program concepts; questions about implementation; assess all participants again in the areas of child behavior, parenting stress, and parenting sense of competence

### **Data Analysis Plan**

The study's main hypotheses stated that parent competency would increase after participation in C-HOPE, parent stress would decrease, and challenging child behavior would decrease. In order to test these hypotheses, paired samples *t*-tests were conducted to examine if mean differences exist on pre- and post-intervention variables. Dependent samples *t*-tests for paired means is an appropriate statistical analysis when each of the two samples can be matched on a particular characteristic. Given an alpha at 0.05, when a calculated *t*-value is larger than the critical *t*-value, after considering degrees of freedom

(*df*) for dependent samples ( $N - 1$ ), the null hypothesis will be rejected. The dependent samples test of correlated mean differences assumes a normal distribution or a curve that is bell shaped and symmetrical. The assumption of normality was examined with a Shapiro-Wilk test and met expectations. Scores on the ECBI, PSI-4, and BPS served as the outcome measures. In addition to the paired samples *t*-tests, effect sizes were also calculated for each of the main outcome measures. Although Type 1 Error increases with multiple outcomes in paired sample *t*-tests, the small sample size of the study led to a greater need for this type of data analysis as opposed to analyses of variance or multivariate analyses of variance. The paired samples *t*-test, instead, was used as a simpler and cleaner way to examine the data without inflating the apparent outcomes of the study. Paired sample *t*-tests and effect sizes were also used to examine parent outcome (ORS) and therapeutic alliance (SRS/GSRS). Therapist fidelity and parent satisfaction were analyzed as percentages and means, respectively, with a minimum of 80% fidelity expected to satisfy expectations, and a minimum mean of three (out of four) on the satisfaction Likert scale expected to satisfy expectations. Groups were analyzed and compared at baseline and final time points to ensure no group differences existed. The first author utilized Statistical Package for the Social Sciences version 24.0 (SPSS 24.0) for all statistical tests and calculations. Additionally, due to concerns with attrition, all data were analyzed using intent-to-treat analyses.

## **CHAPTER 3**

### **RESULTS**

#### **Demographic and Baseline Characteristics**

Before conducting the main analyses to test the hypotheses, one-way analyses of variance (ANOVAs) were calculated for nondiscrete data and chi-square tests of independence were calculated for discrete data in order to determine whether there were differences between groups prior to their participation in C-HOPE. These analyses were conducted based on a number of baseline characteristics, including child age, gender, and race; mother's and father's years of education; with whom the child lives; number of child's siblings; total household income; and whether or not the child was on medication or participating in other therapies outside of school (e.g., applied behavior analysis, speech/language therapy, etc.). Additionally, analyses were conducted based on the child's total score on the SCQ or M-CHAT-R/F. Finally, analyses were conducted based on the main outcome measures at baseline. None of these one-way ANOVAs or chi-square tests was significant, indicating that Group 1 and Group 2 were similar at baseline (see Tables 3.1 and 3.2).

Table 3.1

*One-way analysis of variance in baseline data: Group assignment*

Factor	Source	SS	df	MS	F	p
Age in months	Between groups	146.67	1	146.67	0.19	0.67
	Within groups	10043.73	13	772.60		
	Total	10190.40	14			
Mother years of schooling	Between groups	5.19	1	5.19	0.63	0.44
	Within groups	107.21	13	8.25		
	Total	112.40	14			
Father years of schooling	Between groups	7.50	1	7.50	1.21	0.30
	Within groups	68.19	11	6.20		
	Total	75.69	12			
SCQ Total Score	Between groups	40.74	1	40.74	1.16	0.30
	Within groups	456.59	13	35.12		
	Total	497.33	14			
Time 1 BPS Score	Between groups	25.38	1	25.38	0.10	0.76
	Within groups	3462.36	13	266.34		
	Total	3487.73	14			
Time 1 ECBI Score	Between groups	595.06	1	595.06	0.60	0.45
	Within groups	12901.88	13	992.45		
	Total	13496.93	14			
Time 1 PSI-4-SF Score	Between groups	2.52	1	2.52	0.00	0.95
	Within groups	7869.21	13	605.32		
	Total	7871.73	14			

Table 3.2

*Chi-square tests of independence for baseline data: Group assignment*

Factor	df	$\chi^2$	P
Gender (Male)	1	1.76	0.19
Child lives with (e.g., mother and father in same home, mother only, etc.)	2	1.36	0.51
Race (White)	1	1.03	0.31
Total household income	3	2.09	0.56
Child on medication	1	0.08	0.78
Child receiving speech/language therapy	1	0.02	0.88
Child receiving applied behavior analysis	1	0.05	0.83
Child receiving individual therapy	1	0.27	0.61

In addition to making comparisons in baseline data based on group assignment, comparisons were also made based on whether participants were living in rural areas.

Again, one-way ANOVAs were calculated for nondiscrete data and chi-square tests of

independence were calculated for discrete data. None of these one-way ANOVAs or chi-square tests was significant, indicating that there were no differences between rural and nonrural resident participants at baseline (see Tables 3.3 and 3.4).

Table 3.3

*One-way analysis of variance in baseline data: Rural participants*

Factor	Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Age in months	Between groups	1757.47	1	1757.47	2.71	0.12
	Within groups	8432.93	13	648.69		
	Total	10190.40	14			
Mother years of schooling	Between groups	1.11	1	1.11	0.13	0.73
	Within groups	111.30	13	8.56		
	Total	112.40	14			
Father years of schooling	Between groups	0.69	1	0.69	0.10	0.76
	Within groups	75.00	11	6.82		
	Total	75.69	12			
SCQ Total Score	Between groups	1.86	1	1.86	0.05	0.83
	Within groups	495.48	13	38.11		
	Total	497.33	14			
Time 1 BPS Score	Between groups	58.80	1	58.80	0.22	0.65
	Within groups	3428.93	13	263.76		
	Total	3487.73	14			
Time 1 ECBI Score	Between groups	2636.00	1	2636.00	3.16	0.10
	Within groups	10860.93	13	835.46		
	Total	13496.93	14			
Time 1 PSI-4-SF Score	Between groups	164.00	1	164.00	0.37	0.55
	Within groups	5758.93	13	443.00		
	Total	5922.93	14			

Table 3.4

*Chi-square tests of independence for baseline data: Rural participants*

Factor	<i>df</i>	$\chi^2$	<i>p</i>
Gender (Male)	1	0.01	0.93
Child lives with (e.g., mother and father in same home, mother only, etc.)	2	1.98	0.37
Race (White)	1	1.98	0.16
Total household income	3	3.43	0.33
Child on medication	1	0.02	0.88
Child receiving speech/language therapy	1	1.98	0.16
Child receiving applied behavior analysis	1	3.64	0.06
Child receiving individual therapy	1	1.36	0.24



In addition to comparing baseline characteristics across different groups of participants who completed C-HOPE, the researchers also wanted to examine characteristics of the participants who enrolled and then later dropped out of the study and/or did not complete the final evaluation measures ( $N = 5$ ). Differences in these participants as compared to participants who completed all study activities could have important implications for researchers and clinicians. Therefore, one-way ANOVAs were calculated for nondiscrete data and chi-square tests of independence were calculated for discrete data, based on completers versus non-completers. None of these one-way ANOVAs or chi-square tests was significant, indicating that there were no differences at baseline between individuals who completed the study and those who did not (see Tables 3.5 and 3.6).

Table 3.5  
*One-way analysis of variance in baseline data: Non-completers*

Factor	Source	SS	df	MS	F	p
Age in months	Between groups	146.67	1	146.67	0.19	0.67
	Within groups	10043.73	13	772.60		
	Total	10190.40	14			
Mother years of schooling	Between groups	5.19	1	5.19	0.63	0.44
	Within groups	107.21	13	8.25		
	Total	112.40	14			
Father years of schooling	Between groups	7.50	1	7.50	1.21	0.30
	Within groups	68.19	11	6.20		
	Total	75.69	12			
SCQ Total Score	Between groups	40.74	1	40.74	1.16	0.30
	Within groups	456.59	13	35.12		
	Total	497.33	14			
Time 1 BPS Score	Between groups	0.53	1	0.53	0.02	0.90
	Within groups	379.20	13	29.17		
	Total	379.73	14			
Time 1 ECBI Score	Between groups	885.63	1	885.633	0.92	0.36
	Within groups	12519.30	13	963.02		
	Total	13404.93	14			
Time 1 PSI-4-SF Score	Between groups	1044.30	1	1044.30	2.96	0.11
	Within groups	4591.30	13	353.18		
	Total	5635.60	14			

Table 3.6

*Chi-square tests of independence for baseline data: Non-completers*

Factor	<i>df</i>	$\chi^2$	<i>p</i>
Gender (Male)	1	1.76	0.19
Child lives with (e.g., mother and father in same home, mother only, etc.)	2	1.36	0.51
Race (White)	1	1.03	0.31
Total household income	3	2.09	0.56
Child on medication	1	0.08	0.78
Child receiving speech/language therapy	1	0.02	0.88
Child receiving applied behavior analysis	1	0.05	0.83
Child receiving individual therapy	1	0.27	0.61

### **Main Outcomes: Child Behavior, Parent Stress, and Parenting Sense of Competency**

The main hypotheses of this study were that parents/caregivers who participated in the asynchronous group discussion board format of C-HOPE would experience: (1) greater parent competency, (2) decreased child problem behavior, and (3) decreased parent stress, after their completion of the program. In addition to reported on these hypotheses, internal consistency (Cronbach, 1951) for each of the measures, calculated using the current data set at final evaluation, are reported throughout this section. For the first hypothesis, there was not a significant difference in the scores for parenting sense of competence, as measured by the BPS ( $\alpha = 0.88$ ), pre-intervention ( $M = 55.20$ ,  $SD = 17.59$ ) and post-intervention ( $M = 50.50$ ,  $SD = 17.51$ );  $t(9) = 1.11$ ,  $p = 0.30$ . For the second hypothesis, there was a significant difference in the scores for challenging child behavior, as measured by the ECBI ( $\alpha = 0.90$ ), pre-intervention ( $M = 146.40$ ,  $SD = 35.36$ ) and post-intervention ( $M = 123.10$ ,  $SD = 28.35$ );  $t(9) = 3.05$ ,  $p = 0.01$ . Using the pre-measure  $SD$ , the effect size for this analysis ( $d = 0.73$ ) was found to fall between Cohen's (1988) convention for a medium ( $d = 0.50$ ) to large ( $d = 0.80$ ) effect. For the third hypothesis, there was a significant difference in the scores for parent stress, as measured

by the PSI-4-SF ( $\alpha = 0.94$ ), pre-intervention ( $M = 122.60$ ,  $SD = 25.73$ ) and post-intervention ( $M = 109.50$ ,  $SD = 26.47$ );  $t(9) = 2.51$ ,  $p = 0.03$ . The effect size for this analysis ( $d = 0.50$ ) was found to meet Cohen's convention for a medium effect ( $d = 0.50$ ).

Pearson correlations (Table 3.7) were also calculated for the main outcomes of the study. There was a significant moderate positive relationship between challenging child behavior ( $M = 146.40$ ,  $SD = 35.36$ ) and parent stress ( $M = 122.60$ ,  $SD = 25.73$ ) at baseline ( $r = 0.69$ ,  $p = 0.00$ ,  $N = 15$ ), as well a significant strong positive relationship between challenging child behavior ( $M = 123.10$ ,  $SD = 28.35$ ) and parent stress ( $M = 109.50$ ,  $SD = 26.47$ ) at final evaluation ( $r = 0.85$ ,  $p = 0.00$ ,  $N = 10$ ).

Table 3.7  
*Pearson correlations for main outcomes*

		1.	2.	3.	4.	5.	6.
1. Time 2 - Child Behavior (ECBI)	<i>r</i>	1.00	0.13	0.85**	0.16	-0.46	-0.29
	<i>p</i>		0.72	0.00	0.66	0.18	0.42
	<i>N</i>	10	10	10	10	10	10
2. Time 1 - Child Behavior (ECBI)	<i>r</i>	0.13	1.00	0.14	0.69**	-0.48	-0.34
	<i>p</i>	0.72		0.71	0.00	0.17	0.18
	<i>N</i>	10	15	10	15	10	15
3. Time 2 - Parent Stress (PSI)	<i>r</i>	0.85**	0.14	1.00	-0.34	0.40	0.41
	<i>p</i>	0.00	0.71		0.34	0.25	0.24
	<i>N</i>	10	10	10	10	10	10
4. Time 1 - Parent Stress (PSI)	<i>r</i>	0.16	0.69**	-0.34	1.00	-0.03	0.43
	<i>p</i>	0.66	0.00	0.34		0.94	0.09
	<i>N</i>	10	15	10	15	10	15
5. Time 2 - Parenting Sense of Competence (BPS)	<i>r</i>	-0.46	-0.48	0.40	-0.03	1.00	-0.01
	<i>p</i>	0.18	0.17	0.25	0.94		0.97
	<i>N</i>	10	10	10	10	10	10
6. Time 1 - Parenting Sense of Competence (BPS)	<i>r</i>	-0.29	-0.34	0.41	0.43	-0.01	1.00
	<i>p</i>	0.42	0.18	0.24	0.09	0.97	
	<i>N</i>	10	15	10	15	10	15

*Note.* \*\* = Correlation is significant at the 0.01 level (2-tailed).

## **Secondary Outcomes: Treatment Fidelity and Social Validity**

In addition to testing the main hypotheses, collected measures of treatment fidelity and social validity were also examined and analyzed. Therapist treatment adherence, as measured by fidelity checklists, ranged from 85.50% to 100.00% ( $M = 95.37$ ,  $SD = 4.52$ ) for each session. Parent-reported satisfaction with sessions, as measured by satisfaction questionnaires, was high ( $M = 3.60$ ,  $SD = 0.20$ ). Parent well-being scores, as measured by the ORS, improved significantly from the first session ( $M = 26.12$ ,  $SD = 6.27$ ) to the eighth session ( $M = 27.37$ ,  $SD = 6.62$ ),  $t(17) = -3.64$ ,  $p = 0.00$ ; however, Cohen's  $d$  of 0.19 did not quite reach a small effect size for this outcome. Finally, therapeutic alliance was fair according to the SRS ( $M = 36.80$ ,  $SD = 2.80$ , range = 26.30-40.00) and GSRS ( $M = 36.80$ ,  $SD = 2.82$ , range = 26.30-40.00). Examining alliance across sessions, it did not improve significantly from the first session ( $M = 32.35$ ,  $SD = 6.54$ ) to the final session ( $M = 35.25$ ,  $SD = 6.04$ ),  $t(7) = -0.89$ ,  $p = 0.40$ .

## **Final Evaluation Scores across Groups**

Just as differences between groups were examined at baseline, the groups were compared at final evaluation, as well. One-way ANOVAs were calculated for Group 1 and Group 2, as well as for participants living in rural areas and those living in nonrural areas, to compare means of the main outcome variables. None of these tests was significant, indicating that all participants were similar after completion of C-HOPE (see Tables 3.8 and 3.9).

Table 3.8

*One-way analysis of variance in final evaluation data: Group assignment*

Factor	Source	SS	df	MS	F	p
Time 2 BPS Score	Between groups	25.38	1	25.38	0.10	0.76
	Within groups	3462.36	13	266.34		
	Total	3487.73	14			
Time 2 ECBI Score	Between groups	595.06	1	595.06	0.60	0.45
	Within groups	12901.88	13	992.45		
	Total	13496.93	14			
Time 2 PSI-4-SF Score	Between groups	2.52	1	2.52	0.00	0.95
	Within groups	7869.21	13	605.32		
	Total	7871.73	14			

Table 3.9

*One-way analysis of variance in final evaluation data: Rural participants*

Factor	Source	SS	df	MS	F	p
Time 2 BPS Score	Between groups	58.80	1	58.80	0.22	0.65
	Within groups	3428.93	13	263.76		
	Total	3487.73	14			
Time 2 ECBI Score	Between groups	2636.00	1	2636.00	3.16	0.10
	Within groups	10860.93	13	835.46		
	Total	13496.93	14			
Time 2 PSI-4-SF Score	Between groups	164.00	1	164.00	0.37	0.55
	Within groups	5758.93	13	443.00		
	Total	5922.93	14			

In addition to group assignment and geographical location, the researchers also wanted to know whether there were differences in final outcomes based on race. Because only three of the ten participants in the final dataset identified as Black, and the other seven identified as White, differences are examined descriptively. Overall, it appeared that Black parents reported slightly higher levels of challenging child behavior at baseline, but this factor decreased similarly after participation in C-HOPE across racial groups. The other main outcomes appeared similar across racial groups at baseline and final evaluations. See Table 3.10 below for *Ms* and *SDs* in baseline and final evaluation based on race.

Table 3.10  
*Descriptive data based on race*

Factor	Black participants		White participants	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Baseline child behavior (ECBI)	168.00	20.42	137.29	37.43
Final child behavior (ECBI)	137.33	27.47	116.86	28.52
Baseline parent stress (PSI)	154.00	16.82	162.00	36.30
Final parent stress (PSI)	114.33	10.97	126.29	24.25
Baseline parenting competency (BPS)	55.00	7.21	55.00	6.00
Final parenting competency (BPS)	57.67	7.37	54.00	7.46

### **Course Utilization Data**

Canvas, the cloud-native learning management system used to host the group session videos and discussion boards, as well as course files/handouts, collected data regarding usage of the discussion board and other course pages by the participants. Total time spent engaged in the Canvas platform ranged from 320 minutes, or five hours and 20 minutes, to 683 minutes, or 11 hours and 23 minutes ( $M = 516.00$ ,  $SD = 133.29$ ). The time spent engaged on Canvas did not include group session viewing times, as the videos were housed privately on Vimeo. Total page views (i.e., opening particular discussion board and course material links, including accessing the group session Vimeo links) ranged from 128 to 303 ( $M = 231.91$ ,  $SD = 60.92$ ). Across all four group sessions, 41 different discussion topic prompts were posted by the first author (i.e., nine to 11 topics per session). Participants were encouraged to participate in as many discussion board topics as they felt comfortable, but no minimum number was set as an expectation. Discussion board posts per participant across the four group sessions ranged from 12 to 41 ( $M = 29.36$ ,  $SD = 10.08$ ). Overall, it appeared that participants were engaged and interacting with the Canvas course material and completing group sessions as expected.

Table 3.11 below provides examples of discussion board prompts and participant responses per session.

Table 3.11

*Examples of discussion board prompts and responses*

GS#	Prompt	Sample Response(s)
1	Topic #2: The C-HOPE Triangle. How do you see the C-HOPE triangle (child behavior, parent stress, parenting sense of competency) playing out in your own life? In your child's life?	Initial response: "My child's behavior definitely plays a role in my stress level. It often determines where I go and who I am around when my child is with me. Most people don't really understand him because they have a false sense of what ASD is suppose to look like. When he is having a bad day, I am rarely able to be consistent in my approach to discipline. Its like we walk on egg shells because we never really know how he is going to handle any given situation. I often feel like a bad parent when it comes to him because I find myself often just giving him what he wants to avoid further confrontations. My son can and will become violent, so I try to avoid making him frustrated but I know I did myself in a deeper hole. This in turn stresses me out and cause me to become frustrated with him."  <ul style="list-style-type: none"> <li>• Another participant's reply to this response: "My daughter's challenges easily leave me feeling like I'm not doing/haven't done enough, that somehow I should be able to engage her better and more consistently; even with behavioral strategies I feel like I don't try hard enough, exercise the strategies consistently enough, stay 'on my game' enough. It starts to make me feel paralyzed sometimes."</li> </ul>
2	Topic #4: Replacement Behaviors. Given your unique child's challenging behavior(s), what are some positive replacement behaviors/skills that you can identify? Looking at the Replacement Behaviors worksheet, what are some	Initial response: "A positive replacement behavior would be for [my son] to transition from outside to inside the house when we are all done with playing, without falling to the ground, because he does not want to come inside. So, I want to teach [my son] that he can walk inside the house and go to his room or his sensory room to have some quite time to relax and drop to the ground, nicely, instead of falling to the ground outside to avoid coming inside. This would still give him the input

positive replacement behaviors you can identify for the specific behaviors listed?

that he needs, falling to the ground, whatever that provides for him, and allow for a safer way to drop. This can become a safety issue when he decides he wants to stay on the neighborhood playground longer and tries to fall in the street, he doesn't do it much, but has on occasion. I believe he has more of these types of behaviors when he is really sleepy.”

- Another participant’s reply to this response: “The sleepy part plays a big role with [my son] too! Nights he goes to bed earlier (like 8p) he is up at 5:30a- and his day at school does not go well. I think maybe he is tired before he evens gets there and certainly by end of school day!”

- 3 Topic #11: Emotional Grounding  
Which emotional grounding technique(s) do you think you might select to practice over the course of the next week as your relaxation exercise?

“I definitely use more of the soothing grounding. Especially when I in the car going from place to place with fighting and screaming kids in the back seat or overwhelmed at work or at I home, I always go to music or pray. I feel that this is more in the soothing category. It helps take my mind off of what is going on and then has been focus on positive images, songs, verses, etc. It completely takes me to a new place from where I was.”

- 4 Topic #4: Stages of Grief. Have you found yourself experiencing any of the stages of grief presented today? Have they followed a cyclical pattern, or are they more like a “rollercoaster” in your experience? What have you done to cope and to get yourself through any/all of the stages? Are there any stages that were presented which you have not experienced? Any you were surprised by?

“Yes, experienced these all & still go back through them as challenges & even smooth times occur. My denial was interesting because I wasn’t in denial about him having autism, I saw red flags & acted immediately. I limited my discussions with those that did not validate my concerns & we got him into First Steps quickly. My denial was when we started the process. I thought that because we were intervening early, that the therapists & teachers could ‘fix’ him & he would be ‘normal,’ maybe just a little quirky. I did not understand how this would eventually affect almost every part of our lives. How he would continue to be overwhelmed by small things, how he would need ongoing speech therapy & we still struggle to get or relay basic information to him, how it would take years to potty train, how he would continue to struggle to know how to play with toys, how his baby brother would pass him on certain skills, etc. So before I go on too much, yes, the stages of grief are alive & well because through this journey, I



In addition to the quotes from parents drawn from the discussion boards, parents were also encouraged to provide feedback following each group and individual session. Some comments made by parents when solicited following sessions included, “learning new concepts that my child may have or need to work on is helpful in understanding [his] overall reactions to things,” “seeing comments from the other parents [was a strength],” and “I appreciated...this last session where we were asked to make a plan for our own well-being (this is not something I would do if not asked to do it).” Parents also provided constructive feedback. Specifically, the biggest challenge noted most often by participants was the time commitment of one to two hours per week for sessions and additional time dedicated to implementing plans and tracking data outside of sessions. Parents sometimes noted that they would not have minded the two-hour time commitment for group sessions as much, had they been able to interact with the other parents in person as opposed to completing the sessions on the computer independently.

## CHAPTER 4

### DISCUSSION

This study is unique to others that have been published examining parent-mediated behavior intervention programs in that it considers all three major factors of child behavior, parent stress, and parenting sense of competence – other programs typically target only one or two of those three key areas. Additionally, it was crucial to evaluate factors of treatment fidelity and social validity due to these being common factors on treatment outcomes, including the therapist, the client, and the relationship variables (McGrew et al., 2016). One of the most novel features of this study is the utilization of a web-based asynchronous discussion board for group sessions. The web-based feature is an important use of technology for families from various diverse groups who have been shown to have difficulty accessing appropriate clinical services, including those living in rural locations, those from racial and ethnic minority backgrounds, and those with low socioeconomic status and/or parental education (Thomas et al., 2007).

#### **Study Findings**

**Baseline scores.** Because there were no significant differences found between groups at baseline with regard to demographic characteristics or pre-intervention scores and screeners, the findings suggest the groups were similarly comprised and thus, positive outcomes post-intervention were more likely due to C-HOPE itself than they would have been had the groups looked differently at baseline. Additionally, the range of functioning on the autism spectrum was similar across groups, and parents reported similar levels of their own sense of competency, their stress, and their children's challenging behaviors. Finally, there were no differences between participants living in

rural areas and those living in nonrural areas. These similarities provide validity to the rest of the results.

**Challenging child behavior.** After participation in C-HOPE, parents reported significantly lower levels of challenging child behaviors, suggesting that the skills they learned through the group and individual sessions were generalizable to their home and community settings, and they were able to see positive changes in the way their children behaved after their participation and application of skills learned. Anecdotally, many of the parents did well with regard to following through on the proposed behavior plans developed during Individual Session 2 and modified throughout the rest of the sessions. Parents participated in the sessions with strong behavioral tracking data, questions about plan implementation, and feedback regarding how they saw the plan working for their family and their child's life. Parents not only asked questions of the first author during individual sessions, but they also asked questions of each other on the discussion board and shared stories of success with regard to their plans.

The finding of significantly decreased challenging child behavior is not exactly novel in parent-mediated behavioral intervention research, although the format used in this study was indeed unique. As mentioned in Chapter 1, multiple researchers have targeted this outcome variable in development and implementation of interventions. However, the development, implementation, and monitoring of individualized behavior plans is a unique component of C-HOPE, and it is possible that the improvements in challenging behavior were tied in some ways to the behavior plans developed. As will be discussed later in this chapter, follow-up a few months after intervention is a suggested future direction, in order to help determine whether there are lasting effects on

challenging behaviors. Specifically, it would be interesting to learn whether parents who participated in C-HOPE are later better equipped to handle challenging behaviors and address them using the skills learned throughout the sessions. It would also be interesting to compare follow-up results regarding challenging child behavior after participation in C-HOPE to follow-up results from similar programs, such as SSTP.

Further, the opportunity for parents to interact asynchronously on the group discussion board, ask questions of each other, share success in their current plans and with regard to techniques that have worked for them in the past, is unique and fills a gap in the research. Although many existing intervention programs feature a group component, the main focus tends to be on behavioral psychoeducation during group sessions and does not allow as much time for discussion or interaction centered on the topics presented. C-HOPE is unique in that it not only allows, but encourages, group discussion regarding the psychoeducational topics of behavior and behavioral management. Questions are posed to encourage participants to think about the material, apply it to their lives, and share with others the connections they made regarding their own children and their behaviors.

**Parent stress.** The additional finding of parent stress being significantly lower post-intervention, with a medium effect size, was also meaningful given the population and the small sample size. Issues regarding the sample size are identified within the section of this chapter titled, “Study Strengths and Limitations.” After participation in C-HOPE, parents reported significantly lower levels of stress. This could be linked to a number of factors, including the theoretical framework discussed in Chapter 1 with regard to challenging child behavior, parent stress, and parenting skills all being linked. It

could also be tied to the fact that each group and individual session of C-HOPE focuses in some way on parent stress, encouraging the participants to think about and identify their stressors and responses, and equipping them with tools to manage their stress.

As discussed in Chapter 1, the theoretical frameworks proposed by other researchers (Harper et al., 2013; Hastings, 2002; Lovaas et al., 1973; McCubbin & Patterson, 1983) support the idea that a decrease in challenging child behavior is correlated with a decrease in parent stress, and vice versa. Therefore, the findings of the present study are consistent with findings of previous research. However, they likely also suggest new ideas. Many existing intervention programs for parents of children with ASD lack a therapeutic component which focuses on the wellbeing and needs of the parents themselves. C-HOPE intentionally addresses this through teaching parents various therapeutic techniques for stress management, encouraging them to think about their stress levels and the impact it has on their lives in general, and leading them through creating their own stress prevention and wellness plans.

**Parenting sense of competence.** There was not a significant difference in parent-reported sense of competence after participation in C-HOPE. It is possible that parenting sense of competence is more difficult to target and treat through the asynchronous nature of the group discussion board, and it is also possible that the small sample size contributed to the lack of significance for this final outcome. Further, there is a possibility that the BPS was not the best measure of competence as addressed by C-HOPE. Although this measure has been validated in previous parent research (e.g., Karp, Lutenbacher, & Wallston, 2015; Ohan, Leung, Johnston, & Eaton, 2000), the measure has not been validated specifically with ASD populations and it is possible that parent

competence looks different for this population than with other populations. On the other hand, BPS scores appeared somewhat high at baseline, so a ceiling effect could also explain the lack of significance with regard to this variable.

Anecdotally, several parent participants commented that participation in C-HOPE increased their confidence in their abilities to do their jobs as parents of children with ASD and challenging behaviors. Perhaps with more iterations of this line of research, we will find a significant increase in parenting sense of competence after completion of C-HOPE, particularly with regard to the asynchronous group discussion modality.

**Treatment fidelity and social validity.** Results indicated that parents reported being satisfied with the C-HOPE individual and group sessions overall, and they also felt that the first author implemented the intervention with fidelity. Additionally, parent well-being scores improved significantly from the first session to the final session, which suggests that parents felt better individually, interpersonally, socially, and/or overall after participating in C-HOPE. Finally, therapeutic alliance was fair, with a mean score of 36.80 out of 40.00 across all sessions, as rated by parent participants. This is important as suggested by ample literature (e.g., McGrew et al., 2016; Safran & Waller, 2004) documenting alliance, or a strong therapeutic relationship, as one of the best indicators of client outcome in intervention and therapy. Regarding this study, the therapeutic relationship was built through not only interaction with the first author on the group session discussion boards, but also on the telephone during individual sessions via attentive and empathic listening, asking of relevant questions, and connecting ideas shared from session to session and across group and individual sessions.

Results of the present study were consistent with results from the pilot study (Kuravackel et al., 2017), wherein therapist treatment adherence ranged from 76.2% to 100.0% ( $M = 94.2$ ,  $SD = 7.1$ ) and parent-reported satisfaction with sessions was high ( $M = 3.7$ ,  $SD = 0.3$ ). Further, pilot research indicated that parent well-being scores improved significantly from the first session ( $M = 24.8$ ,  $SD = 8.8$ ) to the eighth session ( $M = 30.8$ ,  $SD = 8.5$ ),  $t(17) = -3.71$ ,  $p = 0.002$ . Therapeutic alliance was fair according to the SRS and GSRS ( $M = 37.2$ ,  $SD = 2.8$ , range = 27.2-40.0), and one-way ANOVA revealed no differences between FF and TH modalities in the areas measured: fidelity:  $F(1, 29) = 1.16$ ,  $p = 0.29$ , satisfaction:  $F(1, 29) = 0.24$ ,  $p = 0.63$ , well-being:  $F(1, 25) = 0.63$ ,  $p = 0.44$ , and alliance:  $F(1, 29) = 0.07$ ,  $p = 0.79$ .

The consistent results across the pilot study and the present study with regard to treatment fidelity and social validity suggest that C-HOPE can be implemented with fidelity, seen as socially valid for parent participants, and produce similar outcomes with regard to parent-reported wellbeing and therapeutic alliance, across time, geographic location, and researcher/therapist. More specifically, C-HOPE can produce similar results regardless of modality (i.e., face-to-face, traditional telehealth, and asynchronous group discussion board formats), location (i.e., C-HOPE has been carried out through locations in urban and rural areas of Kentucky, as well as a separate state, while the first author was completing internship and leading the intervention online), and who delivers the intervention (i.e., different researchers participated in implementation across time and modalities, but all followed the C-HOPE treatment manual).

## **Asynchronous Interventions**

One of the biggest gaps in the literature which this study begins to fill is that of asynchronous interventions being implemented with ASD populations. As mentioned in Chapter 1, asynchronous interventions are gaining popularity in various fields of research (e.g., Allaire, 2015; Myers & Roth, 2016; Spadaro & Hunker, 2016). However, such interventions have not been studied extensively with the ASD population. Allaire's work, so far, is the closest to the current study in that it involved asynchronous electronic discourse among preservice teachers regarding their educational interventions in the classroom. However, Allaire's study was not an intervention in itself, but rather just a place for the preservice teachers to discuss topics of interest with regard to their own intervention and gain ideas from one another.

Due to the shortage of research involving ASD and parent populations participating in asynchronous interventions, this study only begins to fill a gap in the literature. However, the work that has been done and the findings that follow it begin to provide support for such interventions to be used with ASD family populations, and this is especially important given the lack of access to clinical services for underserved populations (e.g., individuals from racial and ethnic minority groups, individuals living in rural areas such as Appalachia, and individuals of low socioeconomic status and/or educational level), as discussed in Chapter 1.

Further, the course utilization data collected and presented in Chapter 3 reflects the ability and willingness of parents who seek services to follow through with the expectations of clinical interventions delivered asynchronously. Parents accessed the group session videos, viewed relevant handouts and links suggested to them, and



participated in the discussion boards, oftentimes spending several hours per group session viewing materials, adding their own comments to the discussion board, and responding to the comments of others in the group. These results begin to provide support for the use of asynchronous group interventions for parents of children with ASD who have a need for services.

### **Implications for Clinicians**

Through the iterative approach taken to investigate C-HOPE across its different modalities and across time and geographical location, the researchers have developed a comprehensive treatment manual guiding the clinician through each session, complete with tips for carrying out sessions via telehealth versus face-to-face. Accompanying the treatment manual is a parent workbook, complete with all session handouts and forms, copies of PowerPoint presentations for group sessions, and additional resources for families. It is the researchers' intent to publish this manual and workbook for use with a range of children and families, after continuing to make improvements based on participant feedback and outcomes. Due to the need for clinicians serving families with ASD to be trained and experienced and to understand autism as a spectrum, the researchers state in the introduction to the treatment manual that, although clinicians implementing C-HOPE do not need specific training to do so, they should be master's-level clinicians or doctoral-level psychologists who have training and experience working with families with ASD.

In addition to the results of the present study influencing the treatment manual and parent workbook, clinicians can glean information for use with the children and families with whom they work. For example, the development of individualized behavior

plans was a major component of this study, and a decrease in challenging child behavior was a major outcome post-intervention. Although the decrease in challenging behavior cannot be tied directly to the development and implementation of behavior plans, parents anecdotally reported having a better understanding of their children's behavior and how to influence it through the behavior plans, psychoeducational information shared during individual and group sessions, and interaction with other parents through the discussion board. Clinicians can use this information to understand the importance of using psychoeducation for challenging behaviors in session, as well as working with families to develop behavior plans that are individualized to the child and fluid to adapt to the needs of the family. Additionally, it is important for clinicians to remember the power of providing parents with the tools they need to intervene directly with their children, especially because as the child continues to develop and his/her behaviors begin to manifest differently across time, the parents may be better equipped to manage challenges than they would if they had not had experience of developing and implementing behavior plans in consultation with a clinician previously.

### **Study Strengths and Limitations**

A strength of this study was that parents found the intervention meaningful and satisfying. Parents made positive comments and provided helpful feedback with regard to the strengths they viewed as part of the intervention specifically and the study as a whole. Overall, it seems that the activities in C-HOPE encouraged parents to think about their children's behaviors, their stress as parents and individuals, and their parenting strategies in different ways than they had before or otherwise.

However, parents also noted challenges to the program when asked to provide feedback. Specifically, they noted the time commitment as one of the biggest challenges, sometimes suggesting that live interaction with other parents during group discussion weeks may have aided in overcoming this challenge. This suggests that, although many parents found value in the interactions present on the group discussion board, some may have preferred a face-to-face or traditional telehealth (where parents are physically present in the same place but the therapist is connected with them remotely) modality. However, the asynchronous group discussion board modality was developed to provide an additional option for families and clinicians who may not be able to access each other otherwise, due to travel, childcare, scheduling concerns, etc. Clinicians who wish to implement C-HOPE in the future should be mindful of family preferences and goodness of fit when considering modality of the intervention.

In addition to limitations of the modality/program, the modest sample size and lack of power are likely the most glaring limitations to this study. Specifically, the small sample size minimized generalizability and introduced larger possibility of error. The initial intent was to utilize a waitlist control design, as done in previous iterations of the study, but due to difficulties with recruitment, it was determined that a pre-post design would be more appropriate. However, even with the 15 parents/caregivers initially recruited for the pre-post design, retention was still a concern. Due to the low sample size, it would be difficult to generalize results. Further, the pre-post design itself is a limitation, as it cannot be said with confidence that decreases in challenging child behavior noted by participants were due to participation in C-HOPE rather than some other factor(s), due to the absence of a control group. Finally, the presence of nested data

presents a limitation. It would be impossible to parse out the dynamics and discussions present between Group 1 and Group 2. However, it was necessary to separate participants into two separate groups due to the time constraints present with regard to conducting individual sessions by phone, as well as the difficulty for participants to keep up with group discussions in a larger group. Therefore, the nesting of data was unavoidable in this particular study, but it must be acknowledged as a limitation. This study still provides important information for moving forward with additional research and implementation of C-HOPE.

### **Suggestions for Future Directions**

This study has built upon pilot research that has been conducted with families across urban, suburban, and rural Kentucky over the past several years. As aforementioned, the ultimate goal of this line of research is to publish the treatment manual and accompanying parent workbook which reflect the results of the pilot research, as well as the experiences and feedback of the families who participated. The researchers' wish is for C-HOPE to be accessible and impactful for families in a variety of modalities, including face-to-face, telehealth, and asynchronous. The most obvious next step would be to test C-HOPE in a randomized controlled trial (RCT) with a large and diverse sample. Ideally, the RCT would include four groups: a face-to-face group, a traditional telehealth group, an asynchronous discussion board telehealth group, and a control group. Additionally, follow-up evaluation post-intervention (e.g., six months after completion of final evaluation) could provide valuable information about the effects of C-HOPE, especially when completed after an RCT.

Adding some kind of outside evaluation of the major targeted outcomes (e.g., researcher observation, parent-recorded videotapes, etc.) may provide meaningful data in addition to parent report, which is currently the only type of measure used to track progress. Further, the researchers may consider adding an additional group modality to study: a synchronous group discussion, where parents can interact with each other and with the clinician in real time via videoconferencing, but from separate locations. The synchronous discussion group would function similarly to a live online class, where the clinician would lead the group discussion just as typically done in face-to-face and traditional telehealth modalities, and parents would be able to interact throughout the entire session. This would address the participant comments made about the time commitment likely being more “worth it” if parents were able to interact with each other “live,” while also preserving the need for some families to avoid travel time and/or expenses.

### **Research Questions and Theoretical Framework**

The main research questions focused on the primary treatment outcomes of challenging child behavior, parent stress, and parenting sense of competence. Although there was no significant difference in parenting competence after participation in C-HOPE, challenging child behavior and parent stress decreased significantly, with at least medium effect sizes. These research questions were drawn from the theoretical framework of the study, which was built upon the current literature base suggesting that children with ASD display more challenging behavior than other children (e.g., Matson, Wilkins, & Macken, 2008), that parents of children with ASD report experiencing higher levels of stress than do parents of other children (Hayes & Watson, 2013), that parenting

self-efficacy is correlated with parent stress, challenging child behaviors, and parent depression (Jones & Prinz, 2005), and that incorporating parent training into treatment for ASD can lead to better outcomes overall (Lovaas et al., 1973).

In addition to building on the current literature base, the present study also fills some important gaps in the literature. Most notably, there has been no research conducted examining asynchronous parent support and training for the ASD population. This study provides preliminary support for such a program. Further, the actual components of C-HOPE are unique to other programs in that they focus on individualized and targeted treatment in the three main outcome areas, as opposed to a prescribed course of treatment which is inflexible to the needs of the individual family. This is especially noteworthy given the need to expand ASD services to rural and underserved areas, where the population's needs may differ from those in more concentrated and urban settings with higher access to resources and services. In conclusion, this study provides preliminary support for an asynchronous group discussion board version of C-HOPE to aid in decreasing challenging child behaviors and improving parent well-being, while remaining socially valid, keeping in-tact therapeutic alliance, and being implemented with fidelity, for families who have a child diagnosed with ASD. Some overall take-home messages relevant to this study in particular are the importance of flexibility in clinical services for families of children with ASD, individualization to the needs of children and families from diverse backgrounds, and empowering parents to take charge of their children's services and their ability to play a critical role in putting plans in place to decrease challenging behaviors in their children and stress in themselves.

Appendix A  
Group Session 1 Fidelity Checklist - Parent

**Instructions:** Below are the components of Group Session 1. Check the following boxes for the elements that occurred during the session.

**1. The therapist:**

- ☐ Described the goals of the session and an overview of upcoming sessions
- ☐ Discussed the role that child problem behavior has on parent stress and parenting skills
- ☐ Discussed the COMPASS model that says children can be competent when their challenges are balanced by supports
- ☐ Reviewed expectations, roles, and confidentiality
- ☐ Discussed how my child is similar and different from other children
- ☐ Described what autism was and its possible causes
- ☐ Described strategies for finding professionals and evaluating treatment options
- ☐ Described theories about how my child thinks
- ☐ Reviewed the ABC form that I used to collect information on my child's behavior
- ☐ Presented a relaxation strategy
- ☐ Had me complete a satisfaction survey
- ☐ Had me complete a rating scale about my thoughts of the group sessions

**2. The session incorporated:**

- ☐ Activities to help understand what was taught (such as what how my child was unique but also similar to the other children, how my child thinks)
- ☐ Handouts for understanding about what autism was, its causes, and how to evaluate treatments
- ☐ Facilitated guidance and structure from the therapist
- ☐ A homework assignment to help me identify a goal for getting more services for my child or helping me to be aware of services that I might access in the future

**3. The group:**

- ☐ Helped me feel supported
- ☐ Helped me feel that I am not alone
- ☐ Provided me with emotional support and to identify ways to promote your self-care and reduce my stress

Appendix B  
COMPASS Satisfaction Questionnaire: Individual Session #1

**Directions:** Rate your experience with the COMPASS Parent Program, with “1” meaning “Strongly Disagree” and “4” meaning “Strongly Agree.” For questions that are not applicable, select “NA.”

1. I felt involved during the individual session and able to express my views.	1	2	3	4	NA
2. The therapist’s communication skills were effective.	1	2	3	4	NA
3. The therapist listened to what I had to say.	1	2	3	4	NA
4. The therapist was able to help me complete and understand the forms given to me.	1	2	3	4	NA
5. The therapist was able to help me identify my top behavior concern for my child.	1	2	3	4	NA
6. The therapist was able to help me understand the data collection method for my child’s behavior (i.e. ABC charts)	1	2	3	4	NA
7. The therapist helped me to identify and clarify a behavior to observe for the next week, utilizing the data collection charts.	1	2	3	4	NA
8. I felt the therapist gained a better understanding of my point of view.	1	2	3	4	NA
9. The time allotted for this individual session was adequate.	1	2	3	4	NA
10. Overall, I am satisfied with the individual session.	1	2	3	4	NA

11. What recommendations do you have for improvement?



Appendix C  
Sample Behavior Plan

**TARGETED BEHAVIOR** Having difficulty calming himself down when upset

PROBABLE PURPOSE(S):     Expressing frustration, possibly attention

NEW SKILL(S) TO TEACH:     Verbally expressing emotions, using self-calming strategies

**Challenges (for teaching the new skill)**

Personal: verbal communication, CHILD accepting that it's going to work

Environmental: consistent access to video/visual cues

**Supports (for teaching the new skill)**

Personal: Smart, can communicate

Environmental: Mom, strong relationship with sister, general education setting most of his day (positive peer role models)

\*\*\*\*\*

**Environmental Changes to be Made** Have extras ready, visuals ready when needed

**Adult Changes to be Made** Teach him when he's calm, consistency when the behavior starts to get worse. If Dad sees it's working, he may be open to trying the same techniques.

**Modifications/Adaptations/Supports to put in Place** 5-4-3-2-1 countdown (using visual support), deep breathing (using YouTube video), squeezing lemons in hands, maybe later try digging heels into ground

Thoughts-Feelings-Actions triangle

**Specific Teaching Strategies** Explain that you want to help CHILD express himself and have his emotional needs met. Explain the Thoughts-Feelings-Actions triangle and how each one affects the others. Explain that it will likely be easiest for CHILD to focus on changing his thoughts (change unrealistic thoughts such as "You never understand me" to realistic thoughts such as "It's hard for me to express myself right now, but if I remain calm and try to explain, I know you will try to understand") and, in turn, his feelings and actions can be changed. Teach calming strategies (counting down, breathing, and squeezing lemons) one by one in short sessions – teach strategies when he is calm and happy. Reward him for practicing.

Planned Reaction when Behavior Does Occur Ignore negative behaviors whenever possible. Once he is calmed down, remind him of one of his strategies and practice it with him/process the situation and try to encourage him to express why he was mad and what he could do differently next time.

### Challenges that will interfere with plan implementation and some solutions

Possible Challenges to Implement the Plan	Solutions to overcome the challenges
<p>The behavior might get worse before it gets better</p> <p>Dad not on the same page as Mom</p> <p>There are a number of different supports needed to implement the plan</p>	<p>Remember the importance of consistency and continue the strategies throughout his display the behaviors</p> <p>When CHILD starts being successful, Dad will see his success and be willing to try the same strategies. Try to explain importance of consistency across the home environment to Dad ahead of time; if he doesn't understand or is unwilling to try it, importance of Mom's consistency with CHILD becomes even bigger!</p> <p>Ensure you have multiple copies of each support (at home, in purse, clipped to CHILD's backpack, in car, etc.) so that they are always on hand. Teach squeezing lemons because he can use that anywhere. Practice a lot at home at first so that he can get used to the terminology and more readily use strategies when outside of home.</p>

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review. *Children and Youth Services Review*, 34(4), 758-770.

## VITA

Alexis D. Rodgers, M.S.

### **Degrees Awarded**

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May 2016	Graduate Certificate in Developmental Disabilities, Human Development Institute	University of Kentucky, Lexington, KY
December 2013	M.S. School Psychology	University of Kentucky, Lexington, KY
May 2012	B.S. Psychology Addiction Specialist Certificate	Saint Vincent College, Latrobe, PA

### **Scholastic and Professional Honors**

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2017	Arvle and Ellen Turner Thacker Research Fund Grant, \$1,000 to support dissertation research
2017	Student Travel Award, International Society for Autism Research
2017	Student Travel Funding Grant, University of Kentucky College of Education
2017	Student Travel Funding Grant, University of Kentucky Graduate School
2016	Student Travel Funding Grant, University of Kentucky College of Education
2016	Student Travel Funding Grant, University of Kentucky Graduate School
2015	Student Travel Funding Grant, University of Kentucky College of Education
2015	Student Travel Funding Grant, University of Kentucky Graduate School
2014	Student Travel Funding Grant, University of Kentucky College of Education
2014	Student Travel Funding Grant, University of Kentucky Graduate School
2013-2015	University of Kentucky Student Affiliates in School Psychology, Ph.D. President
2012	A.J. Palumbo Research Grant, Eastern Psychological Association
2012	Psi Chi Regional Travel Grant, Eastern Psychological Association
2011	Who's Who among Students in American Universities and Colleges Award

## Professional Positions

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- Doctoral Intern in Psychology  
Virginia Beach City Public Schools, Virginia Beach, VA (July 2017-present)
- Pre-Doctoral School Psychology Intern, Lincoln County High School Lincoln County Public Schools, Stanford, KY (August 2016-April 2017)
- Research Assistant, Department of Educational, School, & Counseling Psychology  
University of Kentucky, Lexington, KY (May 2014-June 2017)
- Advanced Practicum Student, Developmental/Behavioral Pediatrics Clinic and Adolescent Medicine Clinic  
Kentucky Children's Hospital, Lexington, KY (August-December 2015)
- Advanced Graduate Student Clinician, Center for Autism Spectrum Evaluation, Research, and Services (CASPER)  
University of Kentucky, Lexington, KY (May 2014-August 2015)
- Teaching Assistant, Department of Educational, School, & Counseling Psychology  
University of Kentucky, Lexington, KY (August 2013-May 2014)
- Practicum Student, East Jessamine Middle School and Red Oak Elementary School  
Jessamine County Public Schools, Nicholasville, KY (August 2013-May 2014)
- Graduate Assistant, Department of Curriculum & Instruction  
University of Kentucky, Lexington, KY (January-May 2013)
- Community Living Support Mentor  
Latitude LLC, Lexington, KY (October 2012-February 2014)
- Special Education Aide, School for Autism  
Pressley Ridge, Pittsburgh, PA (June-August 2012)

## Professional Publications

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- Davis, M. C., Spriggs, A., **Rodgers, A. D.**, & Campbell, J. M. (2017). The effects of a peer-delivered social skills intervention for adults with comorbid Down Syndrome and Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*. doi:10.1007/s10803-017-3437-1.
- Kuravackel, G. M., Ruble, L. A., Reese, R. J., Ables, A. P., **Rodgers, A. D.**, & Toland, M. D. (2017). COMPASS for Hope: Evaluating the effectiveness of a parent training and support program for children with ASD. *Journal of Autism and Developmental Disorders*. doi:10.1007/s10803-017-3333-8.
- Rivardo, M., Brown, K., **Rodgers, A. D.**, Camaione, T., Gowen, G., Minjock, R., & Maurer, S. (2011). Integrating inattentional blindness and eyewitness memory. *North American Journal of Psychology*, 13, 519-538.
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